

"FOR THE SPECIALIZED COMMUNICATION RADIO AMATEUR"

AMATEUR TELEVISION MAGAZINE™

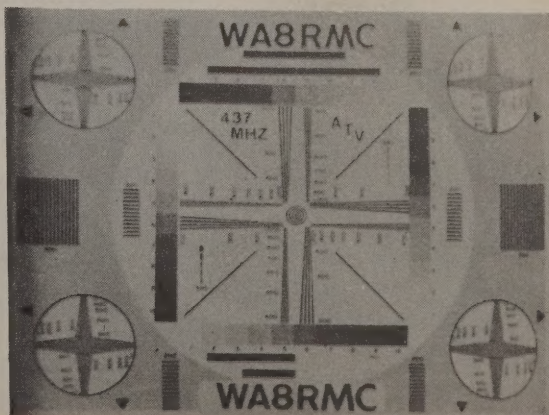
AUGUST 1982 VOLUME 12 NO. 8 PUBLISHED MONTHLY "OUR 16TH YEAR" \$2.00

**FSTV DX DISTANCE REPORTS FLOOD IN!
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- 1.3 Ghz. Alford Slot Omni-Antenna
- Percom "Video Switcher" Review!
- August FSTV-UHF Contest Rules
- ATV Dealer Equipment Directory!
- West Coast Conference Test Results
- US/Canada Commercial TV Guide!
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A5



INTERNATIONAL AMATEUR TELEVISION MAGAZINE

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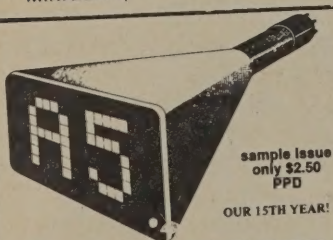
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A5 ATV Magazine may be purchased from: Ham Radio Outlet, 2811 Telegraph Avenue, Oakland, CA 94609, Henry Radio, 11240 W. Olympic Blvd., Los Angeles, CA 90064, Robot Research, 7591 West Convo Court, San Diego, CA 92111, Derrick Electronics, 714 West Kenosha, Broken Arrow, OK 74012, Amateur Radio Equipment Co., 1203 East Douglas, Wichita, KS 62711, ATV Research, 1300 N. Broadway, Dakota City, NB 68731, Spectronics, 1009 Garfield, Oak Park, IL 60304, Amateur Electronics Supply, 4828 West Fond du Lac Avenue, Milwaukee, WI 43216, Silvernail Electronics, 14061 111th Terrace North, Largo, FL 33540, Ray's Amateur Radio, 1590 US Highway 19 South, Clearwater, FL 33516, Universal Amateur Radio Inc, 1280 Aida Drive, Reynoldsburg, OH 43068, Village Green Bookstore, 766 Monroe Avenue, Rochester, NY 14607, Ham Radio World Inc. Oneida County Airport-Terminal Bldg, Oriskany, NY 13424, Science Workshop, PO Box 393, Bethpage, NY 11714, PC Electronics, 2522 Paxson, Arcadia, CA 91006, The Parts Store, 999 - 44th St., Marion, IA 52302 and Prospect News, 2103 N. Prospect Ave., Milwaukee, WI 53202.



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OUR 15TH YEAR!

AMATEUR TELEVISION MAGAZINE

"FOR THE SPECIALIZED COMMUNICATION RADIO AMATEUR"

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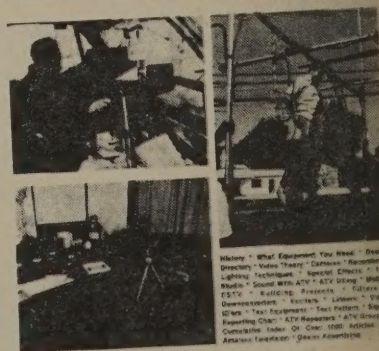
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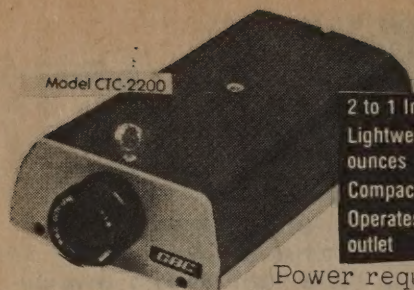
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"OUR 16TH YEAR — SINCE 1967"

**"OFF THE REEL"****A5 Editorial Comments**

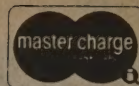
A5 ATV Magazine goes back many years. Looking back through some "old" issues reveals Denson Electronics as an advertising "supporter" from nearly the beginning. The business in Rockville, Connecticut is open for business as usual with a publicized "for sale" status. We hope the firm continues on operating serving the commercial and hobby industry for video parts and service for many years to come. Our sympathy to the Denson family from all of us at the A5 Magazine "family". A very interesting article appeared in the June 82 issue of 73 Magazine (pages 74-78) entitled "Are You Ready for 900 Mhz.?" by John H. Klingelhoefter, WB4LNM of Annapolis, Maryland. A general discussion of the history of 900 Mhz. usage is presented with further discussion of suggested Amateur placement and mode utilization. The article includes a "bandplan" by WB4LNM for the 902-928 Mhz. "proposed" Amateur segment and clearly lists 3 ATV channels at 906.0 (A), 912.0 (B) and 918.0 (C) Mhz. including space for an ATV repeater output area. 902.0 is designated for CW/SSB, 902.6 for FM voice/Rpt mobile receive/Rpt transmit, 927.4 Mhz. (ATV Repeater outputs) and 928.0 for Control links and packet transmissions. While on the surface the article lends direct support for the ATV modes and the bandplan is more than generous for the FSTV emissions, it disturbs me a little that reference is made to the present 400 Mhz. as "not well received" or "not welcome" by users of weak-signal and satellite users in the 435-438 Mhz. regions. Reference was also made that many areas were giving up the 400 Mhz. areas for 1200 or 2300 Mhz. frequencies. The 900 Mhz. "proposed" frequencies are supported as "the answer" for ATV hobbyists with the implementation that the 400 Mhz. region would eventually be given up for other modes to consume. A FURTHER RESEARCH INTO ATV HISTORY WOULD REVEAL THAT FSTV OPERATORS WERE FORCED INTO THE UNPOPULATED UHF 400 MHZ. BAND WHEN NO ONE ELSE WANTED THEM AND NOW THAT THE ATV'ERS HAVE TURNED THE SEGMENT INTO A HIGHLY EFFICIENT AND POPULAR BAND-IT APPEARS IT IS TIME TO UPROOT ATV ONCE AGAIN AND SHOVE THEM HIGHER UP IN THE SPECTRUM. Let's face facts; It was indeed the FSTV UHF/operators who first populated in great numbers the 400 Mhz. regions followed by "satellite" users only within the very recent years. Articles, construction projects, DX activity, etc. were published as far back as the 1930's and 1940's by ATV'ers with heavy numbers of FSTV operators beginning to appear in the 1960's. Weak-signal and Satellite users are the "intruders" not ATV'ers. Tests by W6ORG and others demonstrated that the wideband emissions on ATV were substantially reduced after the first megahertz to levels not interfering with other modes. Throughout the country, ATV'ers have been "blamed" from everything including buzzes, noises, static, harmonics, etc. Once investigated, the sources usually end up being FM Repeaters, links, EME operators, high powered SSB users, satellite users, etc. While we welcome the recognized and "fresh" thinking of including the ATV channels in the 900 Mhz. "proposal" we reinstate our intentions as ATV'ers to maintain our hold on recognized ATV frequencies. The recent publication in the "new" ATV book shockingly revealed a tremendous amount of active ATV Repeaters across the nation in comparison to non-updated directories commonly available (ATV problem). This commonly found attitude makes me sometimes reconsider the many requests for forming an "Amateur Television Society" for an "official" voice on behalf of the FSTV enthusiast. Politics however gets involved, and it scares me to allow a handful of well-intentioned promoters to decide the fate and future of the masses. Maybe the time is coming when such representation should be formed as the ATV modes seem to be getting shoved and attacked more and more. What do you the readers think? Enjoy this our nearly one-year issue anniversary. Our 16th Year begins with our September issue which is being planned as a "special" issue! Check your renewal dates-don't miss any A5's! -QCD

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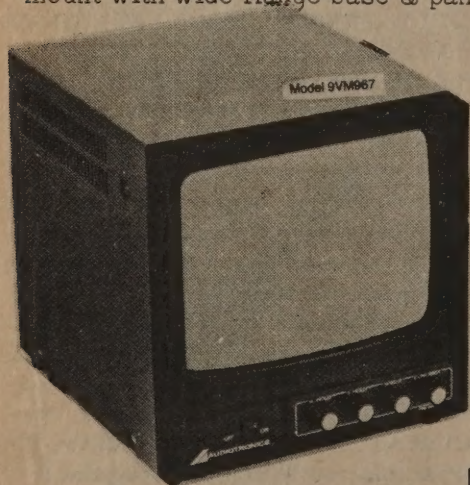
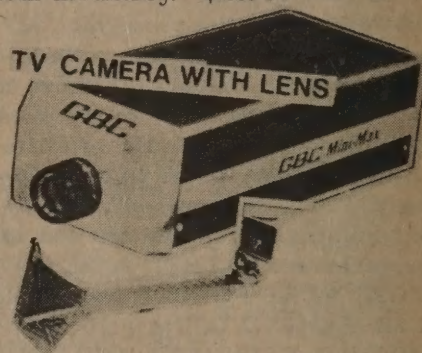
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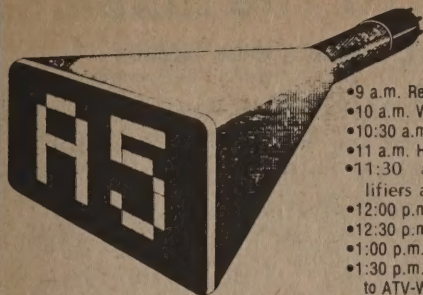
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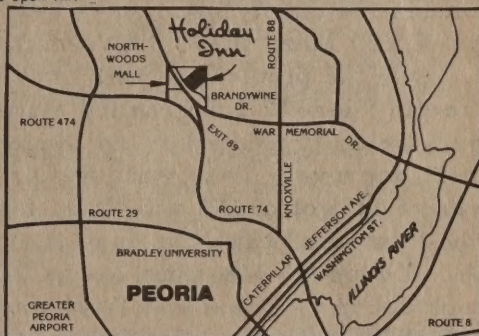
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3RD ANNUAL "MIDWEST STATES" UHF-ATV CONFERENCE

(IN CONJUNCTION WITH PEORIA, ILL. "SUPERFEST" SEPT. 18TH & 19TH)

***FRIDAY, SEPTEMBER 17, 1982**

- 9 a.m. Registration and Display rooms open
 - 10 a.m. Welcome and agenda-WB0QCD-A5 Magazine-Iowa
 - 10:30 a.m. W6ORG FSTV Videotape presentation-Calif.
 - 11 a.m. History of Amateur Television-KB9FO-Indiana
 - 11:30 a.m. ATV RF tips (preamps, filters, amplifiers and antennas) John Beanland, Spectrum Int.-Mass.
 - 12:00 p.m. Using UHF-TV for ATV DX'ing-WB0QCD Iowa
 - 12:30 p.m. FSTV DX'ing-WB0ZJP Missouri
 - 1:00 p.m. Building Projects for ATV-K9KKL Illinois
 - 1:30 p.m. Interfacing Computers and other Amateur Modes to ATV-W9RI Illinois
 - 2:00 p.m. Open Lunch
 - 3:00 p.m. ATV Flybys/Antenna Measuring Contest Mt. Holly Airport-KB9FO Indiana
 - 6:00 p.m. ATV Dinner banquet (Guest speaker 7 p.m.) W9NTP Ind. Evening Session
 - 8:00 p.m. 1296 Mhz. FSTV-K9KK/WA9CZG-Chicago
 - 8:30 p.m. Using FSTV for Public Service (WX)-W5DFU Warren Weldon Oklahoma
 - 9:00 p.m. Nebraska, Minnesota, Iowa, Illinois, Wisconsin Indiana, Michigan, Ohio, Kentucky, Missouri, Oklahoma (Show 'n' tell) ATV State Group Reports
 - 10:00 p.m. A5 Magazine Hospitality Suite Open Till?
- *Plus more ATV/SSTV/RTTY meetings, displays, etc. Including "Movies under the stars" At Peoria 2-day Hamfest! Large flea market area!
- \$20.00 (per adult) includes convention admission banquet dinner, hospitality suite (open bar) and Peoria Hamfest ticket (\$10.00 XYL's)
- \$5.00 Evening Session (Includes Peoria Hamfest Ticket.)



1982 "MIDWEST STATES" UHF-ATV CONFERENCE

Advance Registration Form

Yes, I plan to attend! Enclosed is \$ _____ (\$20.00 per ATV'er) and \$ _____ (\$10.00 per XYL and family members) which covers Convention admission, full Dinner Banquet Menu expenses including a Guest Speaker, Conference evening session, A5 Magazine "Hospitality Suite (Open Bar) and two-day pass tickets for the Saturday and Sunday "Peoria Superfest".

I plan on attending only the evening session. Enclosed is \$ _____ (\$5.00 per ATV'er) which covers Conference evening session admission, A5 Magazine Hospitality Suite (Open Bar) and two-day pass ticket to the "Peoria Superfest".

Also enclosed is \$ _____ (\$48.00 single/\$54.00 double) for reservations at Conference Headquarters Holiday Inn (Holidome) in Peoria, Illinois per night) Please confirm my guaranteed room reservations by return mail.

Name _____ Callsign _____ ATV'er? _____

Address _____ City _____ State _____

Zip Code _____ Phone Number; Area Code () _____ No. attending _____

Send to; Conference Coordinator-Pat Pratt K9ILA, 300 Maple Drive, Pekin, Illinois - 61554



"Letters To The Editor"

P.O. Box H, Lowden, Iowa 52255

"As a FSTV enthusiast for many years, I have made good use of my VCR and I find that it will work also for SSTV. Just record your "mug" - shots and pictures on videotape and play them into the video or camera input of the SSTV converter for "snatching"! This method has almost retired my "audio" recorder." -Stephen Monroe W6SFI-Hollywood California(Editor) Thanks for "tip" Stephen, it works great! Now I can send

everything that I have stored on videocassettes such as my FSTV-DX contacts, home-movies (Hi Hi), etc. The VCR is much more RF proof also during SSTV emissions. I can now give back the Akai Stereo Audio Tape deck to the "family" for music! TNX!

"My interest is purely in Black/White SSTV, NOT COLOR! I seem to "waste" alot of time on 14,230 Mhz. these days which seems to have been taken over by COLOR enthusiasts. Even the picture to "talk" ratio seems to be about 99.7 to .3%! Is Black/White SSTV really "dead"? I overheard some of the COLOR SSTV'ers discussing the second frequency being promoted by A5 Magazine for Generals (14,340 Mhz.) which was not with their approval. They want and promote openly the "low end" of the phone band in which there is alot of DX and Nets. I guess they haven't been around long enough to realize the "damage" that was done years ago within the DX area of twenty meters at 14,230 Mhz. I hope A5 Magazine keeps "Black/White" SSTV alive! I built my first wireless telegraph set in 1909 and was first licensed in 1916 with the callsign "1-UU". -H. K. Wilder K6RB, Atherton, California (Editor) "Black/White SSTV is by no means "dead". Dayton 82 revealed a revitalization of higher resolution coloring and new thinking on SSTV scan converters! Have you ever seen a color SSTV picture? It's fantastic! The work that Don Miller, Robert Suding, Volker Wraase, Howard Mc Afee and Sam Mormino are doing for color SSTV is exciting. I admit however, to some unfortunate self-interest in the almighty dollar being perprotrated on the "airwaves" which is causing alot of hard feelings let alone questionable legal infractions. How about bringing all your years of experience to the General Class SSTV frequencies where Black/White SSTV is growing? Hang in there Ken, "long live" Black/White! -QCD"

"Keep those A5's coming! Even the German "CQ-DL" magazine mentioned A5 in one of its' recent issues. For those interested in a "cheap" 3-memory SSTV system for Color, I have made a printed circuit board for 2 additional memories for the SC-160 converter by Volker Wraase DL2RZ. (It should also work for SC422 series). We also have the 1st 3D stereo SSTV going here with DJ4IG. We are selling the extra memory boards for our "cost" plus shipping expenses for the interested SSTV'ers wanting to get into color but who cannot afford current high prices. Keep up the great work!" -Joachim Breucha DJ4GL Beilngries, West Germany. (Editor-KB6TL Ken in California say's hello!)

"Could anyone send some of your old A5's that are not in use anymore? We have an absolutely terrible time getting technical TV information here. Send via Surface mail. 73 and thanks!" -Zal R. Kabraji VU2DK, 55 Anand Park, Aundh, Poona-411007, India. (Editor) "Hey Zal, do you know VU2ARL Jim Kalassery, Box 1446, Gochin, India 682011 He wrote to us and is interested in the ATV modes. Old copies of A5 on the way. How about some of you subscribers out there? Package up some of those old A5's, OK?"

"Letters To The Editor Continued. . ."

"It is with considerable "pride" that I can report that the South Australian ATV Group has just won permission from the Australian Government Department of Communication to interlink our two ATV Repeaters VK5RTV and VK5RCN. This is a first for VK land and perhaps the "first" such hookup in the world? The fascinating aspect of our Repeaters is that they are at the opposite ends of the technology spectrum; VK5RTV having two microcomputer controllers capable of almost every conceivable function and VK5RCN running entirely on wind and solar energy with minimal remote control capability. Therefore, in designing the interlinking control system we concentrated all the intelligence at VK5RTV with the chief responsibility of avoiding either "feedback" or "lockout" situations. When fully operational, users at either end will be able to establish the interlink between Repeaters by use of "touch tone" signals as simple as keying up your ATV rig! This story will be in future issues of the SA ATV Newsletter of which you subscribe and report to your readers. We anxiously await each issue down here; keep up the good work!" -J. F. Ingham, #37 Second Avenue, Sefton Park, Australia 5083.

"Just a few notes on ATV in the Boston area; The K1VTE Repeater in Malden (5 miles north of Boston) is on the air with 180 watts and available from 12 noon to 12 midnight. A few color pictures are being sent with texture improvement underway through the system. For any FSTV enthusiasts coming this way, the New England ATV Group (NEAT) holds meetings the 4th Tuesday of each month at the bonanza Steak House on Middlesex Street at Malden-Medford line. All are welcome!" -Mel WIBHD (ATV since 1948), 30 Greenleaf Street, Malden, Mass. 02148

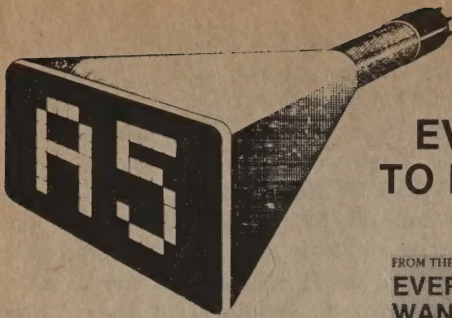
"Mike, I have 3-SSTV Books (ARRL Specialized Communications Handbook Techniques, SSTV by 73 Magazine and The Complete Handbook to SSTV). Does anyone have any corrections to these books on any of the articles etc. ? I am having particular difficulty with the ARRL Flying Spot Scanner article (it doesn't sync properly). Any help from your reader's would be greatly appreciated!" -Joseph E. Meditz, 564 Grandview Ave, Ridgewood, NY. 11385

Excerpts from John Stolp letter; "We were having our morning "get-together" on SSTV at 28.680 Mhz. and right on top of us came another station call CQ contest CQ contest! He didn't ask if the frequency was in use at all! It is so disgusting to work all week looking forward to the TV activity on weekends only to turn on the receiver Saturday mornings and hear another contest going on. This "rude" violating behavior should be printed more in Amateur publications, but just try to get anything negative printed about contests! Perhaps the next A5 SSTV contest, we should all unite a "spread" up and down the legal portions of our bands and give these "lids" a taste of their own medicine? With similar problems on Rtty, Satellites and other specialized modes, there should be more attention paid in publishing these offending problems!" -John Stolp KA6BRT, Oakland, California A5 Comments; "Right-on John! I agree with you 100%. I do not contest myself (other than TV) because it just doesn't seem to "prove anything" anymore. We all know the basic 100 watt transceiver gets out great all over the globe with the right conditions prevailing of which operators have no control. It amazes me some DX'ers who pride 300 plus DX countries can't tell you hardly any real friendships on a long time basis. A quickie (half the time) false signal report through deliberate QRM'ing of operators and onto the next contact. They can't tell you what type of gear the fella is running, what type of antenna he is using, what other hobbies he is into, traits of his immediate family, etc. Don't get me wound up on my "soapbox" about testers either-I lose subscribers! My personal feelings on contests John by the "big" publishers is that it is good for business and subscriptions. Dramatic increases of new subscribers always result after contests. I guess they will always be here my friend, just get in there and "give" it to them during organized SSTV contests!" -QCD

(See John's picture on page 33!)

"ATV is alive and well in eastern Ohio and western PA! Our new Repeater is working well in the East Palestine area. Regular users are KE8S, K8ETC, KA8IVV, KI8U, KB3L, W8YBO, W8YGB W4IQB, WA3ISG and others. (434/42.25-146.775/175)"

-J. Silvo,



FROM THE PUBLISHERS OF A5 ATV MAGAZINE

EVERYTHING YOU ALWAYS WANTED TO KNOW ABOUT ATV* but were afraid to ask

by Mike Stone WB0QCD

FROM THE PUBLISHERS OF AMATEUR TELEVISION MAGAZINE

EVERYTHING YOU ALWAYS WANTED TO KNOW ABOUT AMATEUR TELEVISION *

* but were afraid to ask \$9.95

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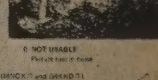
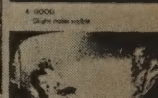
History of What Equipment You Need, Basic Television Operation, Directing, Video Theory, Cameras, Repeaters, and Lighting Techniques, Special Effects, Tele Studio, Sound with ATV, ATV Strong, Mobile, PSTV, Raising Projects, Future, Video, Cables, Test Equipment, Test Pattern, Signal, Reporting Chain, ATV Repeaters, a TV Directory, Complete Index Of Over 1000 Addresses, Dealers, Antenna Suppliers, Ocean Appliances, Downconverter, 12V 100 mhz, Downconverter, Circuit, P-Chet

CHAPTER 12 TRANSMITTING
Adjusting the Video Transmitter
Video Modulator Circuit
Video RF Limiter Circuit
Sine Wave Circuit
PAL to West ATV Limiter Amp
On-Camera Sound Circuit
4 mhz Sound Subcarrier Circuit
Cable and Feeding of Transmitted ATV Lines
ATV Test Pattern

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REPORTING



"If you are active in Amateur Television now, or are thinking about getting involved in it, this reference manual provides you with all the information you'll ever need!" Tom O'Hara W6ORG

Send me ___ copies of "EVERYTHING YOU ALWAYS WANTED TO KNOW ABOUT ATV* but were afraid to ask @ \$9.95 each. Also enclosed is \$2.50 for shipping and handling. (Quantity Dealer Discounts Available).

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Allow 2-3 weeks for delivery

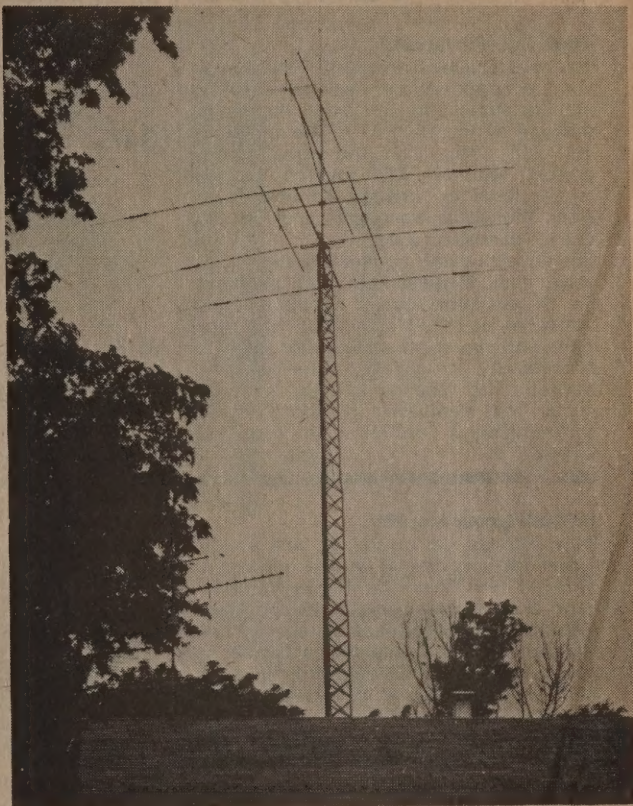
UHF-FSTV HIGH GAIN ANTENNA SYSTEMS

"BRINGING THAT ATV SIGNAL OUT OF THE NOISE FOR SERIOUS DX'ERS"

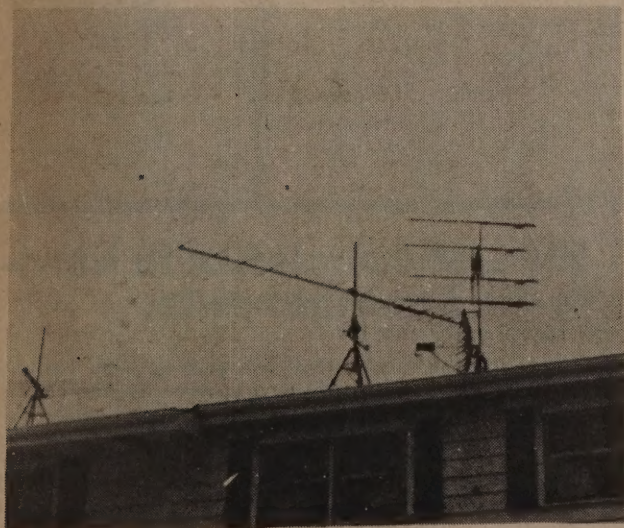


**192 Elements for ATV-DX at 23 db gain!
WB0QCD's HF/VHF/UHF Antenna System**

When stacking multi-element high-gain UHF antennas care must be taken on proper distances between each array-including uniformly fed phasing cable connections to the antenna baluns or loss will result instead of the sought after gain. Popular J-Beams should be 48" (48) 66" (88) apart on the H-frame. Do not make the mistake of flipping the bottom two antennas out of phase when mounting them on the stacking H-frame.

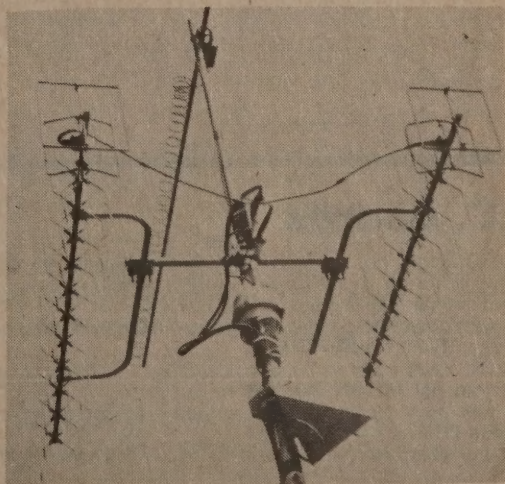


WB0ZJP St. Louis, Missouri uses a pair of K2RIW UHF antennas "horizontally" polarized for "Midwest" DX. Oscar antennas below.



**108 elements of DX power at W9ZIH Chicago!
(Notice the dish for UHF-TV monitoring)**

Ron has worked in excess of 500 miles on ATV, and was "seen" on the 4th of July in Iowa (200 Miles Away) P5 and in color!



W6ORG's ATV System consists of dual 48 element J-Beams, 1296 Mhz. Loop Yagis and a fixed Ghz. Microwave Horn Antenna. Vertical Polarization is prevalent in the west.

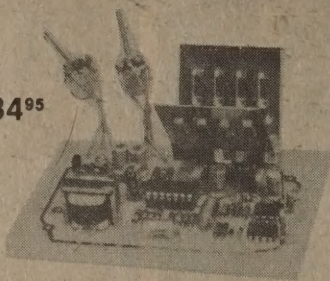
Turn a few hours work into years of fun with Amateur Television.

Audio Squelch Control

You have a squelch on your 2 meter equipment; why not add a squelch to your ATV monitor. Now you can avoid the major problem of operating ATV—the annoying hiss and static when the signal is not present. With the ATV squelch, you no longer have to turn the volume down when the signal disappears and risk the chance of missing a signal.

The squelch easily connects to the TV receiver audio stage without modification of the TV, since the squelch circuit contains its own audio output stage. You must provide your own speaker. Operator safety is provided by using transformer isolation between the receiver and the squelch circuit, thus eliminating the shock hazard when using a "hot chassis" type TV receiver.

\$34⁹⁵



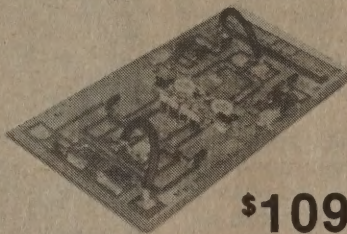
SIL-K Complete Kit—including a detailed instruction manual, printed circuit board and all electrical components. Kit does not include case, speaker and regulated power supply (10 to 15 volts @ 250mA).

SIL-PCB Printed circuit board only. \$10.00

NEW!

100 Watt Linear Amplifier

Now you can get on the air with a high power 100 watt class B linear amplifier for SSB-FM or ATV on the 420 to 450 MHz band and still not spend a lot. This kit is described in Motorola engineering bulletin EB-67 and is available in a number of configurations. For full output, a minimum of 16 watts is required for excitation with an input SWR of not higher than 2:1. Output will maintain stability with a 3:1 collector mismatch at all phase angles. A designed-in low-pass filter suppresses the 2nd harmonic to at least 63 dB down. An external power supply capable of providing 28 VDC, regulated, at 10 amps is also required.



\$109⁹⁵

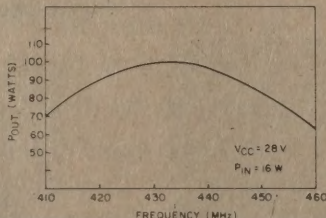
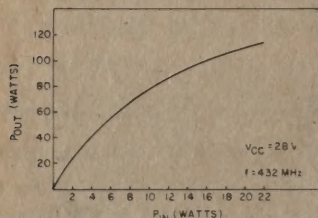
KEB-67-PK Kit includes detailed step-by-step instructions, printed circuit board, and all electronic components as shown.

KEB-67-PCB Printed circuit board \$14.00

KEB-67-I Instruction manual only. \$5.00

TIRED OF BEING TOLD:
"Sorry om, I guess the band is just not good enough to see your pictures tonight?"

This ATV Amplifier Will
Get That Signal Out!



P.C. Boards

The FCC does not allow us to sell Broadband RF amplifier kits in the HF range, therefore we can only offer the printed circuit board and parts on a piece-by-piece basis.

140 watt power amplifier as described in Motorola engineering bulletin EB-63. **EB-63-PCB**

100-180 watt power amplifier as described in Motorola application note, AN-762. **AN-762 PCB**

300 watt power amplifier as described in Motorola engineering bulletin EB-27A. **EB-27A PCB**

Transformers, transistors and other parts are also available.

We also specialize in hard-to-find components.

In addition to our kits, we also stock parts for other Motorola application notes and engineering bulletins. We have an in-depth stock of Motorola VHF and UHF transistors, Underwood metal clad mica capacitors (Unelco), Kemet chip capacitors, Cambion RF chokes, and Ferroxcube Ferrite beads and RF chokes plus other difficult to find parts. If you are having trouble finding a part, call us, we probably have it in stock.

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OMNI-DIRECTIONAL-HORIZONALLY POLARIZED ANTENNA FOR 439 MHZ?

(From "The New Frontier" QST Column by Bob Atkins, KA1GT)

June 1982

1.3 GHz Alford Slot Antenna

QST-

The availability of commercial equipment has led to a considerable increase in 1296-MHz activity in recent years. Mobile-to-mobile activity is now present on the band, and several groups are known to be planning beacons. One thing that both beacons and mobile operation require is a high-gain, omnidirectional antenna, horizontally polarized, since that is the normal mode of operation on the microwave bands.

The antenna described here, an Alford slot antenna developed by Mike Walters, G3JVL, is one solution for this need. I do not have the exact gain measurement on this antenna, but it should show in the order of 6-dB gain over a dipole.

The antenna is constructed by cutting a single slot in the wall of a length of copper tube as shown at A in Fig. 1. The dimensions of this slot depend on the tube and are given for two standard tube sizes in the figure. The top of the slot is shorted by soldering a brass or copper disc to the end of the tube as indicated. The length of the tube below the slot has no effect on the antenna, so the same tube may be used both as antenna and support mast.

The antenna is fed halfway along the slot at the points marked "F" in the drawing. The impedance at these points is about 200 Ω , so a 4:1

balun is required for use with a 50- Ω feed line. Such a balun, constructed from 0.141-in. semi-rigid coax, is shown at B in Fig. 1. A 58-mm slot is cut in both sides of the outer conductor of a length of this coax, and connections are made as shown. This slot may be cut with a hacksaw blade or more conveniently with a small, motorized hand tool that uses a circular saw blade, e.g. Weller "Mini Shop." Such tools are often used by model builders and can be found in hobby stores. Of course, any other 4:1 balun designed for use at this frequency can be used. The coax and balun can conveniently be fed up the center of the tube for a neat installation. If weatherproofing is desired, Teflon adhesive tape can be wrapped around the antenna. Since Teflon is water repellent, this would also serve to minimize icing under winter conditions.

This antenna provides a very sturdy mechanical arrangement and is very useful in exposed locations. Since it does have reasonable gain, care should be taken to mount the antenna with its axis as near vertical as possible to maximize its omnidirectional characteristics in the horizontal plane.

The sources of the information presented here are C. W. Suckling, G3WDG, and an item in *RadCom* (RSGB), Aug. 1981, page 732.

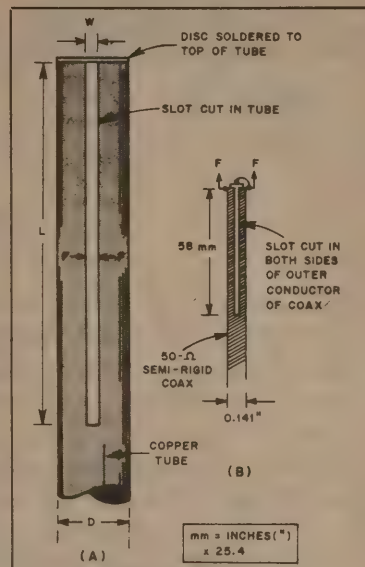
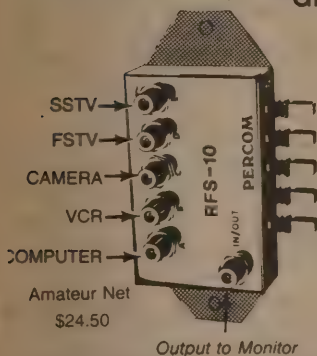


Fig. 1 — Diagram of the 1.3-GHz Alford slot antenna and balun. Dimensions: For D = 1.5 in. (wall 16 swg = 0.064 in.), L = 509 mm and W = 11 mm. For D = 1.25 in. (wall 20 swg = 0.036 in.), L = 509 mm and W = 4 mm.

"A5" REVIEWS NEW PERCOM "RFS-10" VIDEO SWITCHER FOR AMATEUR APPLICATIONS "GIVE THAT ATV SHACK THE PROFESSIONAL TOUCH"



We acquired one of the RFS-10 models of video-switchers from PERCOM Communications Co. and found that it is a valuable piece of unique gear for the FSTV "shack". Video switchers are a very necessary part of the ATV setup when trying to interface video recorders, cameras, computers, etc. to the FSTV transmitter. The model RFS-10 is a single pole, five position switch which alternates on-off selection of signals within a DC to 500 Mhz. frequency range. The unit can be routed two ways; video accessories switched into a common source (ATV rig) or vice versa (Downconverter) into a VCR, TV or 2nd monitor, SSTV input, etc. All six terminals are "F" type connectors for compatibility and are controlled by a simple push button located on the front panel plate. All unused circuits are terminated with 1/4 watt, 75 ohm resistors. Nice wood grained cabinets are optionally available (we mounted our test piece to the bottom piece of our shelf just over the video recorders.) I now have the flexibility of routing Camera 1 (bw) and Camera 2 (color), VCR-1, VCR-2 or SSTV monitor outputs to my PC FSTV rig transmitter. Interface of the VCR's now allows me to send SSTV photos of my entire "library" in FSTV emissions at 439.25 Mhz! Those of you with computers, video games, and other video equipment will be able to easily switch between sources at will. RG59U should be used for cabling. PERCOM carries other video-related gear such as video/audio RF modulators, remote control switching systems, control boxes, TVRO coaxial relays and more! A5 welcomes PERCOM to the A5 advertising "family". Send for a "free" catalog of products today and be sure and mention that you saw their ads in A5! -WBØQCD

(PERCOM) c/o AUC/Advanced Video Components Co., 1621 Indus St., Santa Anna, CA 92707



SE-1a UHF ATV TRANSCEIVER:

Add a camera, antenna, mic, 13.6vdc and a TV set for a complete fast scan ATV station.

STANDARD FEATURES

- SA-1 SYNC AMP FOR SOLID STATE LINEAR AMPLIFIER USE.
- 2 RF STAGE DC-1 CONVERTOR WITH LOW NOISE NE64535 FIRST STAGE.
- BOTH FM AND 4.5MHZ SUB-CARRIER AUDIO.
- RECEIVE TUNES FROM 418MHZ THRU 455MHZ – OUTPUTS TO TV CH. 2, 3 or 4.
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- CUSTOM MADE ALUMINUM ENCLOSURE WITH EPOXY FINISH.
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- 10.8" x 6.2" x 2.5"

\$399.95 + \$4.50 UPS

FREE ATV BOOK "Everything You Always Wanted to know About ATV* but were afraid to ask" (\$9.95 value) with purchase of SE1a ATV transceiver!

Now Available From SE



MBM48/70 J BEAM 15.7 dBd	\$ 75.75
MBM88/70 J BEAM 18.5 dBd	\$105.50
MML 432/50 50WATT LINEAR	\$269.95
PSF 432 BANDPASS FILTER – STOPS INTERMOD ACROSS WHOLE BAND	\$59.95
PMH2-70 STACKING HARNESS FOR 2 J BEAM ANTENNAS	\$16.95

WRITE FOR OTHER ITEMS AVAILABLE

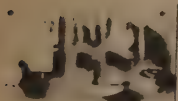
Allow for shipping on above items.

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(5-9:30 PM our time)



ATV KITS AND MODULES



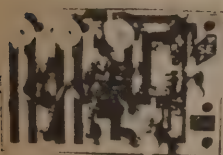
VM-2 VIDEO MODULATOR — Wideband collector video modulator for solid state exciters such as those from GLB and Hamtronics. Input for 4.5MHZ audio sub-carrier. 2 1/2" x 1 1/2"; **\$13.95** kit, **\$18.95** assembled.



A-2 4.5MHZ AUDIO SUB-CARRIER — Accepts audio from VCR or GLB audio processor to provide ATV audio on TV set. Has on-board voltage regulator and shielded inductor. 2 3/4" x 1"; **\$18.95** kit, **\$24.95** assembled.



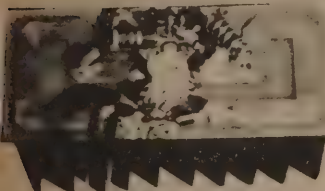
SA-1 VIDEO SYNC AMP — Provides separate video sync gain control for VM-2 above or SE-1a transceiver. Useful when driving solid state amps. 1 3/4" x 1 1/4"; **\$14.95** assembled, **\$11.95** kit.



DC-1 UHF CONVERTOR — Varactor tuned with 2 RF stages. MRF901 input standard. Double sided stripline design. Outputs to TV ch. 2, 3 or 4. Can be tower mounted. 11 — 14vdc. 2" x 3". **\$34.95** kit, **\$49.95**, assembled, **\$79.95** complete in box. Add **\$15.00** for NE64535 1st stage.



P-1 WIDEBAND LOW NOISE UHF PREAMP — Uses MRF901 transistor to provide 16db gain and 1.7db noise figure. Covers 420—450MHZ band. Other frequencies received with change in input inductor. 2 1/4" x 1 3/8"; **\$17.95** kit, **\$26.95** assembled. Add **\$15.00** for NE64535 Option.



LA-1 UHF AMPLIFIER — Uses 15 watt MRF641 transistor with 7.8db gain @ 470MHZ. Stripline inductors with on-board pin diode antenna switching for a receiver. Designed for wideband color video with exciters such as the GLB T450L that provides up to 3 watts drive. Drilled and tapped heatsink included (4 1/2" x 1 3/4"). 1 to 3 watts drive typically gives 6 to 18 watts output. 12 — 14vdc operation @ 4 amps max. Double-sided board is 4 1/2" x 2". **\$69.95** assembled with test data.

LA-45 UHF AMPLIFIER — Uses MRF646. Input power of 6-15 watts typ. gives 20-50 watts output. Biased for linear operation. Kit includes all parts, instructions and 4.2" x 3" double-sided stripline board. Needs 12-14 vdc @ 9 amps max. **\$59.95** kit.

GLB T450L TRANSMITTER — 4 1/2" x 2" RF board typically supplies 2—3 watts FM output, 1 — 1 1/2 watts average video RF output. Changes for wideband video modulation provided. Comes with crystal for 439.25MHZ, with other frequencies available upon request. Also includes separate 1" x 4" audio processor board which supplies audio for FM modulation or for the A-2 4.5MHZ audio kit above. 12—14vdc @ 2 amps max. **\$54.95** kit, **\$74.95** assembled and tuned.

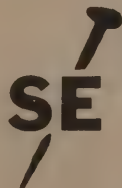
COMMON TO ALL KITS AND MODULES — 12 to 14 vdc operation. Drilled and plated glass circuit boards. Quality components with instructions including schematic and board layout.

Shipping and Handling:
Add 2% — Minimum \$1.50

Add Additional \$2.00 for Blue Label
Florida residents add 4% tax

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"AMATEUR TELEVISION MAGAZINE'S" 1982 NORTH AMERICAN FSTV-UHF CONTEST August 20 - 22, 1982

"IS YOUR SYSTEM UP AND READY TO GO?"

A5 MAGAZINE

FSTV UHF CONTEST

Starts: 1800 EDT August 20

Ends: 1800 EDT August 22

Over \$750 worth of prizes will be awarded in the 1982 A5 Magazine North American FSTV UHF Contest. This 48-hour ATV contest is designed for the UHF specialized communications operator to work as many FSTV contacts as possible with rewarding bonus multipliers and additions for quality picture transmissions, DX distance accomplishments, and bands utilized. All ATV stations in the United States, Canada, and Mexico are eligible for entry. Even stations without transmit capability can participate utilizing a secondary frequency for voice confirmation of received video. Please note that dates and times are in Eastern Daylight Time (EDT).

Contacts must be made on authorized amateur bands and within power limitations as set forth by the governing agency. Transmission of TV signals in recognized SSB, EME, FM, or satellite portions of the UHF bands will not be recognized and becomes grounds for immediate disqualification of entry. No station may claim another station more than one time per band. Crossband contacts are encouraged and authorized.

Portable, mobile, and air-mobile, etc., contacts are allowable as long as verification of location and simplex transmission is used. Contacts via repeaters or any type of relaying device are prohibited. This is not to discourage ATV repeater use, but merely to establish operator and station self-achievement. Secondary audio frequencies for signal coordination are recommended, such as 146.43 MHz FM, 7.290 MHz, and 3.990 MHz. Any locally-utilized secondary voice frequency may be used.

For a valid contact to occur, verification must be established by both the receiving and transmitting stations. This can be accomplished by video return, voice communications, hard-copy photography, or lettered QSL. Proof of contact to be included as logbook entry with required information or enclosed photographs to A5.

Video pictures transmitted must contain as a minimum the station callsign and location along with a signal report of the video received. Standard "P" signal reports will be used.

Quality multipliers, DX distance additions, and band usage multipliers will be used as shown later. Standard air or road maps may be used to determine recorded distances. A circle radius should be drawn from the location of the operating station with increments of 25 miles and dots showing locations of stations worked. The map used must be submitted to the A5 Magazine contest editor along with all log entry information.

Winners with the highest score in each US call area, Canadian province, or Mexican XE1, XE2, or XE3 areas will receive a free one-year subscription to A5 Magazine, a copy of the new ATV book *Everything You Always Wanted To Know About ATV But Were Afraid To Ask*, and a gold Specialized Communications Achievement Award certificate suitable for framing. All entries, regardless of placement, will receive a gold certificate showing participation. The highest-scoring North American winner will also receive a wooden plaque engraving with a large orthodon video tube similar to the A5 Magazine Good Image award, along with his photo in A5 Magazine.

All entries are encouraged to send photos of station operation and contacts received which will be returned by A5 Magazine. Entries must be postmarked no later than September 1st, allowing one week for lettered verifications. All logs will be returned. Please include A5 ATV Magazine subscription expiration date information with your entry.

SCORING:

The base points awarded are determined by the type and strength of signal received.

Many times on long distance contacts or weak band conditions, only the sync bar level is seen, without a video picture. If indeed verification can be accomplished by both stations on a secondary frequency utilizing the "on-off" method with the receiving station stating the actual "on-off" reception test signals, then low-level points can be achieved. It is to the advantage of both stations to watch the bands or apply more power to obtain a better-quality contact with higher points. Continued quality upgrades, including color reception with sound, enhance higher point totals. In case of better conditions further along in the contest, previous claimed contacts may be erased and upgraded if desired.

FSTV UHF CONTEST SCORING

Base Point Table

Points	Contact Type
1	1-way, verified sync or audio tone bar display
2	2-way, verified sync or audio tone bar display
3	1-way, audio sound detected only (subcarrier or on-carrier)
6	2-way, audio sound detected only (subcarrier or on-carrier)
10	1-way, video picture (b&w) detected
15	1-way, video picture (b&w) detected with sound
20	2-way, video picture (b&w) detected
30	2-way, video picture (b&w) detected with sound
40	1-way, color picture detected
45	1-way, color picture and sound detected
80	2-way, color picture detected
85	2-way, color picture with sound

Picture Quality Multipliers

(Base point times P signal quality level)

Base times 1 = P=0 to P=1 picture

Not usable, lost in noise, limited use

Base times 2 = P=2 picture

Passable picture, high noise level

Base times 3 = P=3 picture

Fair picture, noticeable noise

Base times 4 = P=4 picture

Good picture, slight noise visible

Base times 5 = P=5 picture

Excellent, closed circuit, no noise visible

DX Distance Addition

(Base point times P-signal quality multiplier plus DX points)

Note: Distance figured in miles and rounded to nearest 25-mile marker. Plus 25 points for 25 miles, 50 points for 50 miles, 75 points for 75 miles, etc.

Band Used Multipliers

(Base times P-signal quality multiplier plus DX times band used)

1200 MHz = times 2

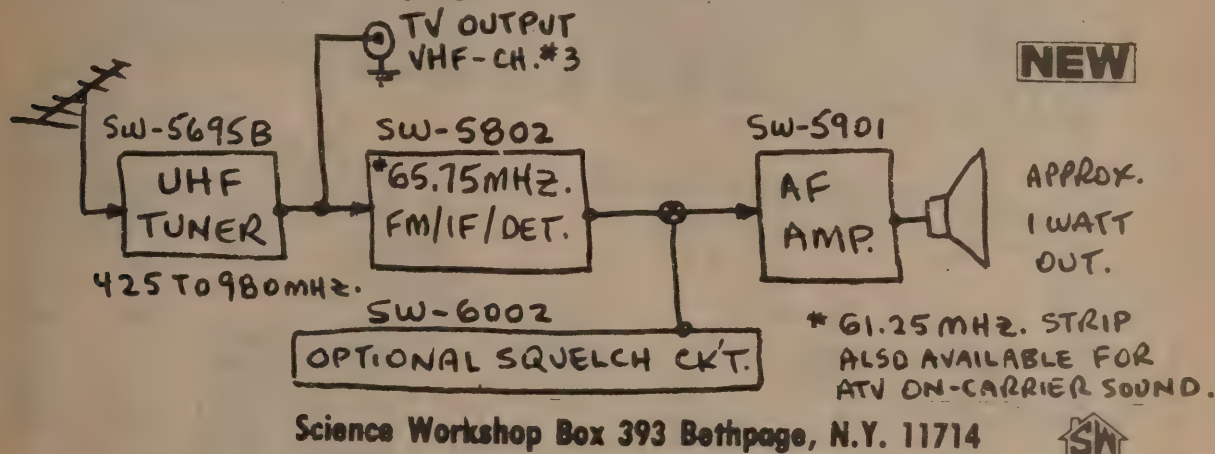
2300 MHz = times 3

Higher frequencies = times 4

"PLEASE PASS THE WORD ABOUT THIS ANNUAL CONTEST!"

SPECIAL "RED HOT" A5 REVIEW OF SW "ATV SOUND RECEIVER" IN NEXT ISSUE!

First actual on-the-air tests with long distance contacts (200 miles) under normal non-DX band conditions were being conducted at the time this issue went to press. The preliminary "results" are fantastic! This is the ATV'ers "dream come true" for adding a very inexpensive ATV FM ON-CARRIER FM RECEIVER (tunable by your present down-converter) in either kit, kit plus cabinet parts or assembled form. Don't miss our next issue for this major "breakthrough" for the serious ATV DX'er! -QCD



PAGBWP

RESULTS

1982 SSTV CONTEST RESULTS

Activity during this year's SSTV contest was relatively mild, but there were indications of video enthusiasm and acceptance by amateurs on the bands. Slow-scanners were noted on several HF bands, many exchanging reports via color rather than black-and-white SSTV. Quite often, we also noticed contest activity giving way to general-interest SSTV views and idea exchanges. Great! If such interests are sparked and a general attitude of friendship developed, a worthwhile purpose is definitely served. DX signals poured into the US on both 10 and 20 meters during the contest's morning periods, and again during the last hours of each day's operation.

We've received requests for shifting the SSTV contest period from April to January or February (its close proximity to Dayton in April creates a "strain" on contesters). What's your opinion? Another item of interest concerns holding "crossband" SSTV activities between Advanced class and General class SSTV'ers during the first 15 minutes of each contest hour. Let's hear your opinions either via mail or via the Saturday SSTV net—and soon. Announcement deadlines for the next contest are nigh. Truthfully, we must show more contest participation, gang, or the contest will be doomed to failure. We know many of you operated, but where are those logs?

This year's SSTV contest winner was Mike Di Persio KC2Q, of Bradley Beach NJ. Congratulations, Mike, and enjoy your year's subscription to 73.

Thanks to all for the participation, and we look forward to your support next time. See you on the Saturday SSTV net (1800 UTC, 14,230 kHz).

Dave Ingram K4TWJ
Richard "Brooks" Kendall W1JKF

FAST SCAN ATV

\$399 Delivered

ALL YOU NEED IN ONE BOX



Connect to the ant. terminals of any TV set, add a good 450 antenna, a camera, and you are there . . . Show the shack, home movies, computer games, etc.

FEATURES

- 10 WATT PEP OUTPUT ON SYNC. DC RESTORED MODULATOR. ADJUSTABLE SYNC. EXPANDER.
- STANDARD FREQ. AVAILABLE: 439.25, 434.0, AND 426.25 MHZ SPECIFY XMTR FREQ. AND DOWN-CONVERTER OUTPUT ON CHANNEL 2, 3, OR 4.
- BROADCAST STANDARD 4.5 MHZ SUBCARRIER SOUND WITH HIGHGAIN MIC AMP.
- 8 MHZ BANDWIDTH MODULATOR FOR HIGH RESOLUTION VIDEO, COLOR, AND COMPUTER ALPHANUMERICS.
- BUILT-IN REGULATED AC POWER SUPPLY.
- TUNEABLE DOWNCONVERTER COVERS 420 to 450 MHZ. CONTAINS LOW NOISE .9db NE64535 PREAMP, PLUS HOT CARRIER DOUBLE BALANCED MIXER.
- STILL \$399 DELIVERED USA VIA UPS. TWO FOR \$750, OR 5 OR MORE 10% OFF.
- SMALL 10.5x3x9 CONTINUOUS DUTY

OPTIONS

- DM-1 RF/VIDEO DETECTOR MONITOR INSTALLED WITH BNC OUTPUT \$30
- TWO FREQUENCY EXCITER INSTALLED WITH XTALS ON 439.25, 434.0, OR 426.25. NOT AVAILABLE WITH CA-1 \$30
- MIRAGE D1010 LINEAR AMP W/"N" CONN . . . \$299
- SET UP TO DRIVE MIRAGE D1010 AMP WITH SYNC STRETCHER IN TXA5 ADJUSTED FOR 90 WATTS PEP \$20
- PROVISION FOR EXTERNAL 12 TO 14 VDC FOR MOBILE OR PORTABLE \$30
- ON CARRIER AUDIO MODULE CA-1 INSTALLED FOR THOSE AREAS THAT DO NOT USE STANDARD SUBCARRIER OR TWO METERS FOR AUDIO . . . \$50

★ IF YOU WISH TO BUILD YOUR OWN SYSTEM, SEE THE BASIC 4 MODULE PACKAGE.

Our terms are Visa or Master Charge \$25 min. by phone or mail, or check or money order \$5 min. by mail. We do not believe in surcharging hams the cost of unnecessary paperwork from purchase orders, CODs and their returns from unhappy housewives, or unpaid invoices, or dealer markups. We try to give you the lowest price possible to promote Fast Scan ATV.

CALL OR WRITE FOR LATEST CATALOG AND PRICES!

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**TOM W6ORG
MARYANN WB6YSS
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P.C. ELECTRONICS

JUNE 82 CATALOG OF PC BOARDS AND MODULES FOR YOUR COMMUNICATIONS SYSTEM

Solid State Fast Scan ATV Modules

CALL OR WRITE FOR LATEST CATALOG AND PRICES!

The Basic Four Modules



"New heavier heat sink!"



1. TXA5-4 ATV EXCITER/MODULATOR \$89 ppd

This wired and tested module is designed to drive the Motorola MHW-710 module in the PA5 10 watt linear amp. The crystal in the 100 mHz region keeps harmonics out of two meters for talk back. The video modulator is full 8 mHz for computer graphics and color. Requires 13.8 vdc reg @ 70 ma. Tuned with xtal on 439.25, 434.0, or 426.25 mHz. Built in sync expander.

Two Frequency Exciter \$115 ppd
Set-up with D1010-N 90W amp add \$20 ppd

2. PA5 10 WATT ATV POWER MODULE \$89 ppd

The PA5 will put out 10 watts RMS power on the sync tips when driven with 80 mw by the TXA5 exciter. 50 ohms in and out, plus bandwidth for the whole band with good linearity for color and sound. Requires 13.8 vdc regulated @ 3 amps. MHW-710-2 \$60 ppd

3. FMA5 AUDIO SUBCARRIER GENERATOR \$29 ppd

Puts audio on with your camera video just as broadcast TV does at 4.5 mHz. Puts out up to 1 v p-p to drive the TXA5 or VM-2, 3, or 4 modulators. Requires low Z mic (150 to 600 ohms), and +12 to 18 vdc @ 25 ma. Works with any xmtr with 5 mHz video bandwidth.

4. TVC-2 ATV DOWNCONVERTER \$55 ppd

Stripline MRF901 (1.7 db NF) preamp and double balanced mixer module digs out the weak ones but resists intermods and overload. Connects between uhf antenna and TV set tuned to channel 2 or 3. Varicap tunes 420 to 450 mHz. Requires +12 to 18 vdc @ 20 ma.

Super sensitive TVC-2L with NE64535 preamp (.9db NF) stage ... \$69 ppd

TVC-4 ATV DOWNCONVERTER \$89 ppd

This is a packaged version of the TVC-2 converter with internal power supply. Has BNC input and F output connectors.

Also available with the NE64535 (TVC-4L) \$105 ppd

Size: 5 1/4 X 2 1/2 X 7 inches.



(Improved version from TVC-1 in Ch. 14 of ARRL Handbook)



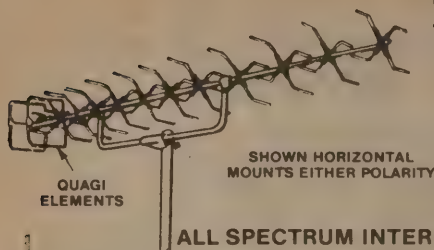
..... Package Specials

TXA5, PA5, FMA5, and TVC basic module package \$249 ppd

OPTIONS: 2 frequency exciter add \$26
NE64535 low noise downconverter add \$15
Packaged TVC-4 downconverter add \$34
Magnacraft W120X-14 coax relay add \$41

Clubs & Groups...10% discount on 5 or more of one module ordered at one time to one address.

J Beam MBM48/70cm ANTENNA ONLY *\$75.75



One of the few antennas that have enough bandwidth for ATV... 3 db down at 420 and 450. Covers simplex and Repeater frequencies with no sacrifice. No balun to buy.

- 15 dbd. 48 elements.
 - 6 foot boom length.
 - Direct 50 ohm coax feed.
- *cod or charge card only due to added UPS shipping charges
- mbm88/70 88 element *\$105.50
pmh2-70 dual phasing harness *\$ 16.65
mf2-48 vert stacking frame *\$ 14.00

ALL SPECTRUM INTERNATIONAL PRODUCTS CAN BE ORDERED THRU P.C. ELECTRONICS

LOW LOSS COAX. 50 ohm Saxton 8285 foam RG8 type 100 ft roll ... \$41 ppd
Only 3.5 db/100' loss at 400 mhz. Tight 95% shield. Other lengths 45 cents/ft + \$5 UPS.

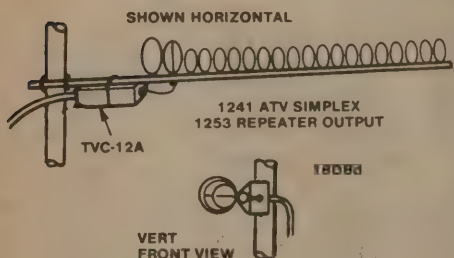
AEA 450 ISOPOLE OMNI GAIN ANTENNA \$65 delivered.
High efficiency decoupling cones puts the all the RF on the horizon where it counts. Great for local ATV round tables, or public service portable work, separate sound subcarrier transmitters, FM remote base and repeaters. Ready to connect to your coax N connector and 1 1/4" mast. Low wind loading and DC grounded for ruggedness.

1200 MHZ ATV SYSTEMS

Use 1278.75 mHz as a duplex atv freq. with others on 439 or 434 mHz by just adding a MMV1296 varactor tripler and 1296-LY loop yagi to your 10 watt transmitter on 426.25 mHz. As long as the 400 and 1200 mHz antennas are more than 5' apart no special filters are needed. To receive just add a 1296-LY loop yagi and the TVC-12a downconverter. Other uses are crossband repeaters to see your own video coming back, repeater links and remote bases, weather radar video, site security, etc.

TVC-12a 1215 to 1300 mHz DOWNCONVERTER \$89 ppd

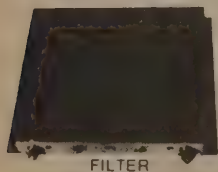
Sensitive NE 64535 preamp stage, remote varicap tuned, downconverts to TV channels 7 or 8. Mounts on 1296-LY antenna to save feedline losses. Requires simple 11 to 18 volt at 20 ma supply made from Radio Shack parts to tune thru IF coax line.



1296-LY LOOP YAGI ANTENNA *\$64.70 + UPS
18 dbd gain and full bandwidth on a 7 ft boom. With N connector.

MMV1296 VARACTOR TRIPLER \$113.45 ppd
Triples ATV, AM, or FM to the 1200 mHz band with 60% efficiency. 20 watts max drive, and no power supply required.

BUILD YOUR OWN ATV REPEATER WITH THESE BASIC MODULES:



FILTER

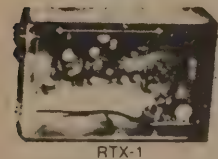
PSF438-ATV INTERDIGITAL VESTIGIAL SIDEBAND FILTER \$131.50 ppd
5 mHz bandwidth for good color and sound but rejection for no desense. Copper plated 7 pole for typ 1.3db insertion loss.

MMC439-ATV CRYSTAL CONTROLLED DOWNCONVERTER ch3 IF ... \$78.45 ppd
.. 45.75 mHz IF 83.45 ppd. Low noise MRF901. 30 db gain.

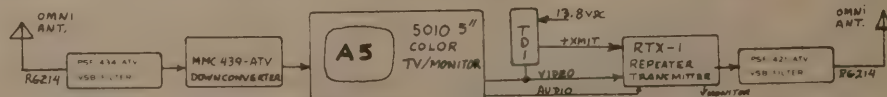
5" LIBERTY MODEL 5010 PORTABLE COLOR TV/MONITOR \$299 ppd

TD-1 TONE DECODER. Detects horizontal sync to key xmtr. pc board \$5.

RTX-1 ATV REPEATER TRANSMITTER MODULE \$325 ppd
Contains sync equalized TXA5 exciter, FMA5 sound subcarrier, MHW10-2 10 watt power module, and DM-1 Detector/Monitor in a shielded diecast aluminum box.



RTX-1



SEND SASE FOR COMPLETE REPEATER INFO including ready to go ATVR-4 for \$2499, adding special effects, mixing two meters, getting rid of desense and interference from other transmitters at the same site, etc.

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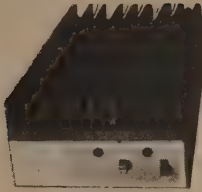
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HOT
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HITACHI GP-41D TRI-ELECTRODE

PORTABLE COLOR CAMERA.....\$490.....\$690ppd

6:1 power zoom 14-84mm, auto iris, F1.6 lens with macro focus for close-ups. 1.5" electronic viewfinder. Boom microphone. Full range variable color temperature control. Superior color and low light sensitivity to 75 lux. 12vdc (6.7 watt load) to 117vac adaptor, AP-4 NC



D1010

D1010-N MIRAGE ALL MODE 100 WATT AMPLIFIER....\$299ppd

420 to 450 mHz, FM, SSB, CW, and ATV. Up to 90 watts pep on ATV with only 4 watts drive. Req. 13.8 vdc reg. at 20 amps. Uses "N" connectors. 12" x 3" x 5 1/2". Specially modified by us for ATV.



DM-1

DM-1 RF/VIDEO DETECTOR & MONITOR.....\$20ppd.

Samples RF off xmtr coax and outputs 1 v p-p video to monitor your own camera and setup. Also outputs to a external 50 uA meter for relative power. Req. +12 to 18 vdc at 25 ma. PC board only\$ 5ppd.



TVG-1



TVG-12

TVG-1, TVG-12, \$15ppd & TVG-23 ATV TEST GEN.\$20ppd ea.

Connect your camera and you have about one milliwatt on the air for demos, ant tests, or receiver alignment. Req. 9vdc at 7 ma. TVG-1 tunes 400-480 mHz, TVG-12 tunes 1200-1300 mHz, and TVG-23 setable 2.1-2.5 GHz.

TSQ-1 TV S-METER AND SQUELCH BOARD\$5ppd

Add common or Radio Shack parts, tap into TVs video IF AGC line, break one speaker lead, and you can better align the antenna, give relative signal reports, and have no noise between contacts.

TVX-1 TELEVISION TRANSMITTER\$500ppd

This is a complete 10 watt UHF TV transmitter in a 3 1/2" high 19" rack panel intended for community television outside the USA or ATV in USA. Takes baseband video and line level audio input from a TVRO, VCR or camera. Also a mic input for voice overs. 117vac 60 hz supply. Video monitor output. 4 to 6 week delivery depending on frequency. Standard atv freq 434, 439.25 & 426.25 avail.

UHF TV channel 14 thru 20 (export only).....\$600

VHF TV channel 7 or 8 (export only).....\$750

240vac 50 Hz supply add \$50. 8 Lbs. Call for details.



HITACHI HV-62U BLACK AND WHITE CAMERA\$205ppd

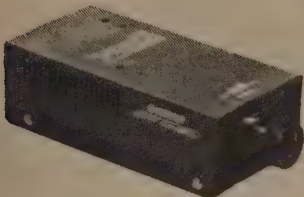
High performance CCTV camera great for ATV or surveillance. 500 line resolution, 10,000:1 auto light compensation. C mount 16 mm F1.6 lens included. 117 vac at 7 watts. small 4 x 2.7 x 8 inches.

HV-62SU externally syncable, 2:1 interlace version.....\$299ppd

WIDE ANGLE LENS HF-9A 9mm F1.4 C-mount.....\$75ppd

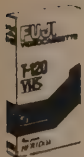
TELEFOTO LENS HF-35A 35mm F1.7 C-mount.....\$75ppd

ZOOM LENS H5X14C 5:1 14-70mm F2.0 C-mount.....\$204ppd



ATV DEMO VIDEO TAPE.....VHS FORMAT.....\$25ppd

This tape is directed toward radio club meeting programs, or groups contemplating getting on ATV. The 21 minute running time shows on the air contacts, equipment, public service uses, voyager 2, and more. If this tape doesnt get your buddies on ATV with you, then nothing will!



P.C. ELECTRONICS is your one stop ATV supplier. As an ATVer for over 20 years, full time business for 4 years, we know what you want. Fast service, state of the art, reasonable prices. We normally ship within 2 days of receiving your order for our equipment if payment is postal money order or charge card. Original designs using latest technology.

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TOM W6ORG



MARYANN WB6YSS

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of the art



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K.V.G.

9 MHz CRYSTAL FILTERS

MODEL	Appli- cation	Band- width	Poles	Price
XF-9A	SSB	2.4 kHz	5	\$50.60
XF-9B	SSB	2.4 kHz	8	68.60
XF-9B-01	SSB	2.4 kHz	8	91.35
XF-9B-02	SSB	2.4 kHz	8	91.35
XF-9B-10	SSB	2.4 kHz	10	119.65
XF-9C	AM	3.75 kHz	8	73.70
XF-9D	AM	5.0 kHz	8	73.70
XF-9E	FM	12.0 kHz	8	73.70
XF-9M	CW	500 Hz	4	51.55
XF-9NB	CW	500 Hz	8	91.35
XF-9P	CW	250 Hz	8	124.95
XF910	IF noise	15 kHz	2	16.35

1296 MHz EQUIPMENT

Announcing the new 1296 MHz units
by Microwave Modules.

Low Noise RECEIVE Converter	MM1296-144	\$139.95
Low Noise RECEIVE Preamp/Filter	MM1296-144	64.95
Low Power LINEAR TRANSMITTER	MM1296-144	399.95

Plus all our regular 1296 MHz items: antennas, filters, triplers

TRANSVERTERS FOR ATV OSCARS 7, 8 & PHASE 3

Transverters by Microwave Modules and other manufacturers can convert your existing Low Band rig to operate on the VHF & UHF bands. Models also available for 2M to 70cm and for ATV operators from Ch2/Ch3 to 70cms. Each transverter contains both a Tx up-converter and a Rx down-converter. Write for details of the largest selection available.

Prices start at \$189.95 plus \$6.50 shipping.

SPECIFICATIONS

Output Power	10 W
Receiver N.F.	3 dB typ.
Receiver Gain	30 dB typ
Prime Power	12V DC



Attention owners of the original MM1432-28 models: Update your transverter to operate OSCAR 8 & PHASE 3 by adding the 434 to 436 MHz range. Mod kit including full instructions \$26.50 plus \$1.50 shipping, etc.

Write for technical data and price details.

ANTENNAS

(FOB CONCORD, VIA UPS)

144-148 MHz J-SLOTS

8 over 8 Hor. pol	D8/2M	12.3 dBd	\$68.40
8 by 8 Vert. pol	D8/2M-vert	12.3 dBd	82.90
8 + 8 Twist	8XY/2M	9.5 dBd	71.40

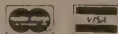
420-450 MHz MULTIBEAMS

48 Element	70/MBM48	15.7 dBd	75.75
88 Element	70/MBM88	18.5 dBd	105.50

UHF LOOP YAGIS

1250-1350 MHz 28 loops	1296-LY 20 dBi	49.75
1650-1750 MHz 28 loops	1691-LY 20 dBi	55.95
Order Loop-Yagi connector extra: Type N		14.95
	SMA	6.45

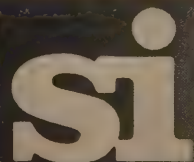
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WB6RIR	5 section coax Collinear	3 WAGBUT TYPE	-1.0
WB6RIR	5 section coax Collinear		1.0
WB6HPH	Dipole array over ground plane		6.0
K6JEY	2 Turn Helical		6.0
WAGEXV	HB LP PC Board LBS DESIGN INC		8.0
K6HCP/K6MYC	LP LOG PERIODIC		8.8
K6JEY	Quad 10 Turn Helix (tweaked)		10.6
WB6GIL	Corner Reflector		10.6
K6JEY	Quad 10 Turn Helix		11.0
K6MOZ	Loop Yagi 29 EL		11.8
K6MOZ	J Beam 30 El (Ref. = 1) EL YAGI		12.0
WB6APU	Fish Pail Horn (without Fish)	3 BT PAIL w/1" PH SCREEN	14.9
K6MOZ	Loop Yagi 28 EL without Refl.		15.0
WB6GIL	Loop Yagi 28 124°-LY		15.7
K6HCP	24 EL TONNA Single Refl.		15.8
WB6HPH	NBS Corner Ref.		15.8
K6HCP	23 EL TONNA Dual Refl.		16.3
WB6HPH	37" dish (spherical)		17.4
WB6GIL	4' dish (ref ant)		18.8

432

WB6APU	41 EL Collinear	6.2
WB6PH	Dual Dipole array with ground plane	6.8
WB6PH (early)	NBS 7.7 dbd standard 1st meas. (ref ant.)	7.7
WB6PH (late)	NBS 7.7 dbd standard 2nd meas. (ref ant.)	7.7
WA6EXV	5 EL Yagi	7.8
WB6HF	9T Helix	8.2
WB6APU	6 EL Collinear	9.9
WA6KDU	13 EL Yagi	10.7
A6GNT	7 EL Yagi	11.1
WB6YVP	18 EL Yagi	12.5
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WA6EKD	10 EL Ring Saturn Loop Yagi	13.9
K6MOZ	dual F8T array	14.5
K6LMN	15 EL Quagi	14.7
K1LL	24 EL Cuscraft	15.7
WB6KMO	19 EL RJW	16.3
WB6KMO	19 EL TAMA	16.3

220

K6LMN	B.B. Dipole (ref ant.)	0.0
K6LMN	7 EL Cushcrat with Quad DE	8.0
WA6OIL	8 EL Quagi	9.2
WA6EKO	Ring Saturn Loop Yagi	9.5
K6DYD	9 EL HB KLM	9.8

GAIN

-7.0
1.0
6.0
6.5 (9.5 circ.)
8.0
8.8
10.6 (13.6 circ.)
10.6
11.0 (14.0 circ.)
11.2
12.0
14.9
15.0
15.7
15.8
16.3
17.4
18.8

CALL

K5JXQ	Angle 218
K6MZ	Angle 218
WB6IMV	Avantek SD9-1227M.
W6GMZ	HB HP 1101

432

W6GMZ	HB HP 1101
K6LMN	AAR P432VDG
W6ENGZ	HB NEC 219
W6EJO	HB MGF 1400 #1 (best at 155)
K6JKO	PAE 432-5
W6EJO	HB MGF1400 #2 (best at 160)
W6MKB	HB HP 6101 #13V
K6JEY	HB 3K597 (retuned, 2nd try)
W6MKB	HB HP 6101 #2 @15V
K6JEY	HB 3K597
WB6IMV	Avantek SK9-1227M
WB6IMV	Avantek SD6-0475M
W6MKB	HB HP 6111 #1

1296

	<u>GAIN</u>	<u>NF</u>
	11.59	0.51
	12.0	0.78
	13.5	4.35
	16.75	0.85

432

	17.8	0.41
	16.9	0.55
st at 155)	13.2	0.64
	19.0	0.88
t at 160)	14.9	0.90
	27.4	1.07
	13.4	1.08
2nd try)	15.8	1.17
	13.0	1.33
	8.0	1.75
	14.3	3.90
	15.2	5.1
	13.8	5.3

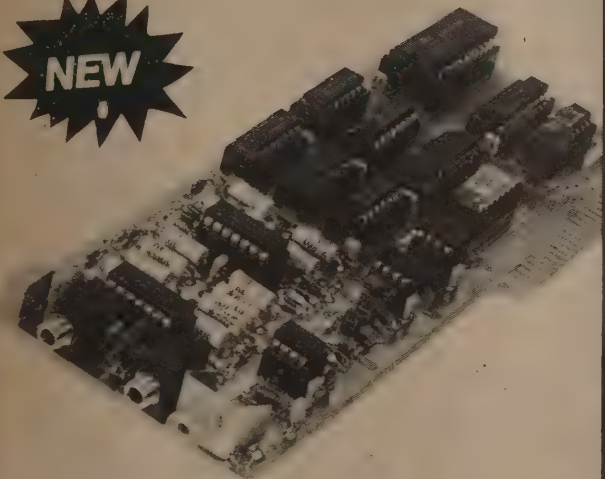
220

	17.5	0.59
	20.7	0.60
	17.8	0.74
	19.0	0.88
(original)	9.4	2.3
	16.7	3.40
	14.9	3.85

144

21.2	1.42
14.5	2.0
16.3	4.0
14.9	4.2

All measurements were conducted utilizing HP 8970A automatic NF meter with micronetics NSA 26A solid state source.



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PHOTOCASTER™

SSTV INTERFACE FOR APPLE II COMPUTERS

The **COMMSOFT** Photocaster (tm), a Slow Scan Television system for the APPLE II computer, is now available for radio amateurs. Photocaster provides an easy way for hams who own APPLE computers to get started on SSTV with a full-featured black and white and color system. Photocaster includes a circuit board to interface an APPLE to a TV camera and a receiver/transmitter, plus a two-disk software package which incorporated many advanced features.

In Addition to transmitting and receiving pictures, PhotoCaster has provisions for adding titles and graphics, creating video special effects, enhancing images, retrieving and storing pictures on disk, printing high resolution pictures with an MX-80 printer, plus much more.

Black And White pictures are processed with a resolution of 128 by 128 pixels and 16 levels of gray. Shades of gray are presented on a standard CRT monitor by using dot dithering. In the color mode, 8 colors are available with 16 saturation levels. Color pictures are taken with an unmodified black and white TV camera using a three-frame RGB sequence. Standard RGB transmission formats are available in addition to a unique APPLE-to-APPLE single frame color mode which takes 8 instead of the usual 24 (or more) seconds to transmit a color picture.

PhotoCaster requires an APPLE II or APPLE II Plus computer with 48K of RAM and one disk drive. The price of PhotoCaster is \$499.95 for the basic system which includes an assembled and tested circuit board and software. A complete system consisting of a Panasonic WV1400 camera, board and software is available for \$749.95. California residents add applicable sales tax. VISA and Master Card orders are accepted.

ATV-DX'ERS Guide to VHF/UHF TV Stations

USA and Canada



Serious ATV-DX'ers, utilize "monitoring" VHF and UHF commercial TV channels in the suspected "band opening" periods as a propagation indicator for successful long distance FSTV DX contacts. As conditions grow stronger, VHF-TV broadcast stations become very dominant and such strong signal strengths will gradually work up into the UHF regions where Amateur Television lies. With Amateur Radio Television located in the 70 cm. band (just under channel 14(470-476 Mhz.), reliable patterns can be used to best advantage for "knowing" when and where the band is opening to. Good strong signals on channel 40 for instance in Dubuque, Iowa can be "seen" by Chicago, Illinois stations as a band indicator for Amateur contacts-a distance of over 200 miles! Many times, the band is "up" on the UHF-TV channels, but the areas covered go unnoticed for the most part because we are not "watching"! Some of the frustrating problems in TV-DX'ing is knowing what station you are watching and where it is coming from. With most commercial stations ID'ing "on the hour" it is hard to get the video callsigns from all the monitored channels at once! Also, some stations do not send locations or the location is in much reduced letters in comparison with the station callsign. One of our A5 MAGAZINE reader's in South Carolina who works for the educational broadcast industry, forwarded this "commercial TV station Guide and Frequency Assignment listing" which will be invaluable to the ATV-DX'er! Our August issue was originally planned as a 40 page issue but we decided that this information was just too important especially during the peak DX season months. Further information can be acquired of this nature from acquiring the 1982 AP Broadcasting Services Broadcasting/Cablecasting Yearbook which can be located at larger libraries or broadcast TV stations.

U.S. TV by Channel

Asternisk (*) indicates non-commercial.

Channel 2 (54-60 mhz)

*WDIQ Dozier, Ala.
KTUU-TV Anchorage
KTUU-TV Fairbanks, Alaska
KNAZ-TV Flagstaff, Ariz.
*KETS Little Rock, Ark.
KNXT Los Angeles
KTUV Oakland, Calif
KWGN-TV Denver
WESH-TV Daytona Beach, Fla
*WPBT Miami
*WTHS-TV Miami
WSB-TV Atlanta
KHON-TV Honolulu
KBCI-TV Boise, Idaho
WBBM-TV Chicago
WTOE Terre Haute, Ind.
KGAN-TV Cedar Rapids, Iowa
KQCT Great Bend, Kan
WBRZ Baton Rouge
WLBZ-TV Bangor, Me.
WMAR-TV Baltimore
*WGBH-TV Boston
WJBL-TV Detroit
*KTCA-TV St. Paul
*WMAB Mississippi State, Miss
KOTV St. Joseph, Mo
KTVI St. Louis
KTVO Billings, Mont.
KNOP-TV North Platte, Neb
KTVN Reno
WGR-TV Buffalo, NY
WCBS-TV New York
WKTV Utica, N.Y.
*WUND-TV Columbia, N.C.
WFMV-TV Greensboro, N.C.
KDIX-TV Dickinson, N.D.
*KGFE Grand Forks, N.D
WDTN Dayton, Ohio
KJRH Tulsa, Okla
KOTI Klamath Falls, Ore.
KATU Portland, Ore
KDKA-TV Pittsburgh
WCBD-TV Charleston, S.C.
*KUSD-TV Vermillion, SD
WNGE Nashville
*WSJK-TV Sneedville, Tenn.
KPRC-TV Houston
KRIO McCallen, Tex
KMID-TV Midland, Tex
KUTV Salt Lake City
KREM-TV Spokane, Wash

WBAY-TV Green Bay, Wis.
KTWO-TV Casper, Wyo.
WKAQ-TV San Juan, P.R.

Channel 3 (60-66 mhz)

*KTOO-TV Juneau, Alaska
KTVK Phoenix
KIEM-TV Eureka, Calif.
KCRRA-TV Sacramento, Calif.
KEYT Santa Barbara, Calif.
KTVS Sterling, Colo.
WFSB-TV Hartford, Conn.
WEAR-TV Pensacola, Fla.
*WEDU Tampa, Fla.
WRBL-TV Columbus, Ga.
WSAV-TV Savannah, Ga.
KGMV Wailuku, Hawaii
KID-TV Idaho Falls, Idaho
KLEW-TV Lewiston, Idaho
WCIA Champaign, Ill.
WSIL-TV Harrisburg, Ill.
KIMT Mason City, Iowa
KARD-TV Wichita, Kan.
WAYE-TV Louisville, Ky.
KATC Lafayette, La
KTBS-TV Shreveport, La.
WJMN-TV Escanaba, Mich.
WKZO-TV Kalamazoo, Mich.
KDLH-TV Duluth, Minn.
WLBT Jackson, Miss
KTVQ Kirksville, Mo.
KYTV Springfield, Mo.
KRTV Great Falls, Mont.
KYUS-TV Miles City, Mont.
*KLNE-TV Lexington, Neb.
KMTV Omaha
KYBC Las Vegas
*KENW Portales, N.M.
WSTM-TV Syracuse, N.Y.
WBT Charlotte, N.C.
WWAY Wilmington, N.C.
*KBME Bismarck, N.D.
WKYC-TV Cleveland
KOET Eufaula, OK
*KVDO-TV Salem, Ore.
*WPSX-TV Clearfield, Pa.
KYW-TV Philadelphia
KLOE-TV Florence, S.D.
KOTA-TV Rapid City, S.D.
WRCB-TV Chattanooga
WREG-TV Memphis
KBTX-TV Bryan, Tex.
KIII Corpus Christi, Tex.
KACB-TV San Angelo, Tex.
KFDX-TV Wichita Falls, Tex.
WCAX-TV Burlington, Vt.
WHSV-TV Harrisonburg, Va.

WTKR-TV Norfolk, Va.
WSAZ-TV Huntington, W. Va.
WISC-TV Madison, Wis.
*WIPM-TV Mayaguez, P.R.
WPJF-TV Phillipsburg, V.I.

Channel 4 (66-72 mhz)

WTVY Dothan, Ala.
*KYUK-TV Bethel, Ark.
KJNP North Pole, Alaska
KVOA-TV Tucson, Ariz.
KARK-TV Little Rock, Ark.
KNBC Los Angeles
KRON-TV San Francisco
KOA-TV Denver
WRC-TV Washington
WJXT Jacksonville, Fla.
WTVJ Miami
KITV Honolulu
*KAID Boise, Idaho
WHBF-TV Rock Island, Ill.
WTVT Bloomington, Ind.
KTVI Sioux City, Iowa
WWL-TV New Orleans
WBZ-TV Boston
WTOM-TV Cheboygan, Mich.
WDIV Detroit
WCCO-TV Minneapolis
WGBI-TV Columbus, Miss.
WDAF-TV Kansas City, Mo.
KMOX-TV St. Louis
KXLF-TV Butte, Mont.
KOUS-TV Hardin, Mont.
KDUH-TV Hay Springs, Neb.
KSNB-TV Superior, Neb.
KCRH-TV Reno
KOB-TV Albuquerque, N.M.
WIBV-TV Buffalo, N.Y.
WNBC-TV New York
*WUNC-TV Chapel Hill, N.C.
KXJB-TV Valley City, N.D.
WCMH-TV Columbus, Ohio
KTVY Oklahoma City
KPIC Roseburg, Ore.
WTAE-TV Pittsburgh
WCIV Charleston, S.C.
WFBC-TV Greenville, S.C.
KPRY-TV Pierre, S.D.
WSM-TV Nashville
KAMR-TV Amarillo, Tex.
KWAB Big Spring, Tex.
KDFW-TV Dallas
KDBC-TV El Paso
KGBT-TV Harlingen, Tex.
KJAC-TV Port Arthur, Tex.
KMOL-TV San Antonio, Tex.
KTVX Salt Lake City

KOMO-TV Seattle
KXLY-TV Spokane, Wash.
WOAY-TV Oak Hill, W. Va.
WTMJ-TV Milwaukee
WAPA-TV San Juan, P.R.

Channel 5 (76-82 mhz)

KWRG-TV Mobile, Ala.
KPHO-TV Phoenix
KFSM-TV Fort Smith, Ark.
KTLA Los Angeles
KPIX San Francisco
KREX-TV Grand Junction, Colo.
KOA-TV Pueblo, Colo.
WTTG Washington
*WUFT Gainesville, Fla.
WPTV West Palm Beach, Fla.
WAGA-TV Atlanta
WMAQ-TV Chicago
WOI-TV Ames, Iowa
KALB-TV Alexandria, La.
WABI-TV Bangor, Me.
WCVB-TV Boston
WNEM-TV Bay City, Mich.
KSTP-TV St. Paul
KCMO-TV Kansas City, Mo.
KSDK St. Louis
KXGN-TV Glendive, Mont.
KFBB-TV Great Falls, Mont.
KHAS-TV Hastings, Neb.
KVUU-TV Henderson, Nev.
*KNME-TV Albuquerque, N.M.
WNEW-TV New York
WPZ North Pole, N.Y.
WTVH Syracuse, N.Y.
WRAL-TV Raleigh, N.C.
KFYR-TV Bismarck, N.D.
WLWT Cincinnati
WEWS Cleveland
KOCO-TV Oklahoma City
KOB Medford, Ore.
WCSC-TV Charleston, S.C.
KIVV-TV Lead, S.D.
KXON-TV Micheli, S.D.
WMC-TV Memphis
WTVF Nashville
KXAS-TV Fort Worth
*KTXT-TV Lubbock, Tex.
KENS-TV San Antonio, Tex.
KRGV-TV Wesiaco, Tex.
KSL-TV Salt Lake City
WCYB-TV Bristol, Va.
KING-TV Seattle
WDTV Weston, Va.
WFRV-TV Green Bay, Wis.
KYCU-TV Cheyenne, Wyo.

WORA-TV Mayaguez, P.R.
ZBTU Roadtown, V.I.

Channel 6 (82-88 mhz)

WBRC-TV Birmingham, Ala.
*KUAT-TV Tucson, Ariz.
KEMY Mt. View, Ariz.
KVIO Eureka, Calif.
*KVIE Sacramento, Calif.
KSBY-TV San Luis Obispo, Calif.
*KRMA-TV Denver
KREZ-TV Durango, Colo.
WCIX-TV Miami
WDBO-TV Orlando, Fla.
WJBF Augusta, Ga.
WCTV Thomasville, Ga.
KIVI Napa, Idaho
KPMI Pocatello, Idaho
WRTV Indianapolis
WOC-TV Davenport, Iowa
KTVG Ensign, Kan.
WPSD-TV Paducah, Ky.
WDSU-TV New Orleans
WVBT-TV Portland, Me.
WLNE New Bedford, Mass.
*WCML-TV Alpena, Mich.
WJIM-TV Lansing, Mich.
WLUC-TV Marquette, Mich.
KAAL Austin, Minn.
KBJR-TV Duluth, Minn.
WABG-TV Greenwood, Miss.
KMOS-TV Sedalia, Mo.
KTMV Butte, Mont.
KWNB-TV Hayes Center, Neb.
WOWT Omaha
KAVE-TV Carlsbad, N.M.
WRGB Schenectady, N.Y.
WECT Wilmington, N.C.
WDAY-TV Fargo, N.D.
*KSRE Minot, N.D.
KTVN-TV Columbus, Ohio
KOTV Tulsa, Okla.
KOIN-TV Portland, Ore.
WJAC-TV Johnstown, Pa.
WPVI-TV Philadelphia
WLNE Providence, R.I.
KPLO-TV Reliance, S.D.
WATE-TV Knoxville, Tenn.
KFDM-TV Beaumont, Tex.
KRIS-TV Corpus Christi, Tex.
KCEN-TV Temple, Tex.
KTAL-TV Texarkana, Tex.
KAUZ-TV Wichita Falls, Tex.
WTVR-TV Richmond, Va.
KHQ-TV Spokane, Wash.
WVVA Bluefield, W. Va.

U.S. TV by Channel

WITI-TV Milwaukee
KBJR-TV Superior, Wis.
*WIPR-TV San Juan, P.R.

Channel 7 (174-180 mhz)

*WCIO Mount Cheaha State Park, Ala.
*KAKM Anchorage
KATV Little Rock, Ark.
KABC-TV Los Angeles
KRCR-TV Redding, Calif.
KGO-TV San Francisco
KMGH-TV Denver
WJLA-TV Washington
*WJCT Jacksonville, Fla.
WCKT Miami
WJHG-TV Panama City, Fla.
KALI-TV Wailuku, Hawaii
KTVB Boise, Idaho
WLS-TV Chicago
KHQA-TV Quincy, Ill.
WTVW Evansville, Ind.
KWVL-TV Waterloo, Iowa
KAYS-TV Hays, Kan.
KOAM-TV Pittsburg, Kan.
KPLC-TV Lake Charles, La.
WVLI-TV Bangor, Me.
WNAO-TV Boston
WXYZ-TV Detroit
WPBN-TV Traverse City, Mich.
KCMT Alexandria, Minn.
WDM-TV Laurel, Miss.
KHQA-TV Hannibal, Mo.
*KMNE-TV Bassett, Neb.
KETV Omaha
*KOAT-TV Albuquerque, N.M.
WKBW-TV Buffalo, N.Y.
WNNY-TV Carthage, N.Y.
WABC-TV New York
WITN-TV Washington, N.C.
KQCD-TV Dickinson, N.D.
WHIO-TV Dayton, Ohio
KSWO-TV Lawton, Okla.
*KOAC-TV Corvallis, Ore.
*WITI-TV Charleston, S.C.
WSPA-TV Spartanburg, S.C.
KEVN-TV Rapid City, S.D.
WBBJ-TV Jackson, Tenn.
KVII-TV Amarillo, Tex.
KTBC-TV Austin, Tex.
KVIA-TV El Paso
KOSA-TV Odessa, Tex.
KLTU-TV Tyler, Tex.
*KUED Salt Lake City
WDBJ-TV Roanoke, Va.
KIRO-TV Seattle
*KSPS-TV Spokane, Wash.
WTRF-TV Wheeling, W. Va.
WSAU-TV Wausau, Wis.
WLWZ-TV Ponce, P.R.

Channel 8 (180-186 mhz)

WLSA Selma, Ala.
KINY-TV Juneau, Alaska
*KAET Phoenix
KAIT-TV Jonesboro, Ark.
KSBW-TV Salinas, Calif.
KFMB-TV San Diego
KJCT Grand Junction, Colo.
*KTSC Pueblo, Colo.
WTNH-TV New Haven, Conn.
WFLA-TV Tampa, Fla.
*WGTV Athens, Ga.
*WGTV Athens, Ga.
*WXGA-TV Waycross, Ga.
KIFI-TV Idaho Falls, Idaho
*WSIU-TV Carbondale, Ill.
WQAD-TV Moline, Ill.
WISH-TV Indianapolis
KCCI-TV Des Moines, Iowa
*KPTS Hutchinson, Kan.
KNOE-TV Monroe, La.
WVUE New Orleans
WMTW-TV Poland Spring, Me.
WAGM-TV Presque Isle, Me.
WOTV Grand Rapids, Mich.
WGTO Sault Ste. Marie, Mich.
*WDSE-TV Duluth, Minn.
KOMU-TV Columbia, Mo.
KULR-TV Billings, Mont.
KPAX-TV Missoula, Mont.
KCNA-TV Albion, Neb.
KOMC McCook, Neb.
KLAS-TV Las Vegas
KOLO-TV Reno
KSWB-TV Roswell, N.M.
WROC-TV Rochester, N.Y.
WGHP-TV High Point, N.C.

WDAZ-TV Devils Lake, N.D.
KUMV-TV Williston, N.D.
WKWV-TV Cleveland
KVJ-TV Sayre, Okla.
KTUL-TV Tulsa, Okla.
*KSYS Medford, Ore.
KGW-TV Portland, Ore.
WGLA-TV Lancaster, Pa.
*KESD-TV Brookings, S.D.
*KZSD-TV Martin, S.D.
*WDCN-TV Nashville
WFAA-TV Dallas
*KUHT Houston
KGNS-TV Laredo, Tex.
KCTV San Angelo, Tex.
WXEX-TV Petersburg, Va.
WCHS-TV Charleston, W. Va.
WKBTV La Crosse, Wis.
KUAM-TV Agana, Guam
WSVI Christiansted, V.I.

Channel 9 (186-192 mhz)

*KUAC-TV Fairbanks, Alaska
KGUN-TV Tucson, Ariz.
*KETG Arkadelphia, Ark.
KECC-TV El Centro, Calif.
KHJ-TV Los Angeles
*KIXE-TV Redding, Calif.
*KQED San Francisco
KBTU Denver
WDVM-TV Washington
WFTV Orlando, Fla.
WTVM Columbus, Ga.
*WVAN-TV Savannah, Ga.
KGM-D-TV Hilo, Hawaii
KGM-B-TV Honolulu
WGN-TV Chicago
*WNIN Evansville, Ind.
KCRG-TV Cedar Rapids, Iowa
KCAU-TV Sioux City, Iowa
WAFB-TV Baton Rouge
WWTU Cadillac, Mich.
CBET Windsor, Ont.
*KAWB Bemidji, Minn.
KMSP-TV Minneapolis
WTVU Tupelo, Miss.
KMBC-TV Kansas City, Mo.
*KETC St. Louis
KCFW-TV Kalispell, Mont.
*KPNE-TV North Platte, Neb.
WMUR-TV Manchester, N.H.
WOR-TV New York
WIXT-TV Syracuse, N.Y.
WSOC-TV Charlotte, N.C.
WNCT-TV Greenville, N.C.
WPCO-TV Cincinnati
WTOV-TV Steubenville, Ohio
KWTU Oklahoma City
KEZI-TV Eugene, Ore.
KABY-TV Aberdeen, S.D.
*KBHE-TV Rapid City, S.D.
WTVU Chattanooga
KRBC-TV Abilene, Tex.
KTSN-TV El Paso
KTRE-TV Lufkin, Tex.
KTPX Monahan, Tex.
*KLRN San Antonio, Tex.
*KCTS-TV Seattle
*WSWP-TV Grandview, W. Va.
WAOW-TV Wausau, Wis.
WSUR-TV Ponce, P.R.

Channel 10 (192-198 mhz)

*WBIQ Birmingham, Ala.
WALA-TV Mobile, Ala.
KOOL-TV Phoenix
KTVE El Dorado, Ark.
KXTV Sacramento, Calif.
KGTU San Diego
KREY-TV Montrose, Colo.
WTSF-TV Largo, Fla.
WPLG Miami
WALB-TV Albany, Ga.
*KMEB Wailuku, Hawaii
*KISU-TV Pocatello, Idaho
WGBM-TV Quincy, Ill.
WTHI-TV Terre Haute, Ind.
KLOE-TV Goodland, Kan.
KAKE-TV Wichita, Kan.
KLFI-TV Lafayette, La.
*WCCB Augusta, Me.
*WMEM-TV Presque Isle, Me.
WILX-TV Onondaga, Mich.
WVUP-TV Sault Ste. Marie, Mich.
*KWCM-TV Appleton, Minn.
WDIO-TV Duluth, Minn.
KTTC Rochester, Minn.
KOLR-TV Springfield, Mo.
KOLN-TV Lincoln, Neb.
KSTF Scottsbluff, Neb.

*KLXV Las Vegas
KBIM-TV Roswell, N.M.
WTEN Albany, N.Y.
WHCC-TV Rochester, N.Y.
KMOT Minot, N.D.
WBNS-TV Columbus, Ohio
KTEN Ada, Okla.
KTVL Medford, Ore.
*KOAP-TV Portland, Ore.
WTAJ-TV Altoona, Pa.
WCAU-TV Philadelphia
WJAR-TV Providence, R.I.
WIS-TV Columbia, S.C.
*KTSR-TV Pierre, S.D.
*WBID-TV Knoxville, Tenn.
*WKNO-TV Memphis
KFDA-TV Amarillo, Tex.
KZTV Corpus Christi, Tex.
KWTX-TV Waco, Tex.
WAVY-TV Portsmouth, Va.
WLSL-TV Roanoke, Va.
*KWSU-TV Pullman, Wash.
*WMMV Milwaukee
KTNW Riverton, Wyo.
WBNS-TV Charlotte Amalie, V.I.

Channel 11 (198-204 mhz)

KTV Anchorage
KTVF Fairbanks, Alaska
KZAZ Nogales, Ariz.
KTHV Little Rock, Ark.
KTTV Los Angeles
KNTV San Jose, Calif.
KKTU Colorado Springs
WINK-TV Fort Myers, Fla.
*WFSU-TV Tallahassee, Fla.
WXIA-TV Atlanta
WTOC-TV Savannah, Ga.
KHAW-TV Hilo, Hawaii
*KHET Honolulu
KMVT Twin Falls, Idaho
*WTTW Chicago
*KDN-TV Des Moines, Iowa
KGLD Garden City, Kan.
*KTWU Topeka, Kan.
WHAS-TV Louisville, Ky.
WBAL-TV Baltimore
WBKB-TV Alpena, Mich.
WTCN-TV Minneapolis
WTOK-TV Meridian, Miss.
KPLR-TV St. Louis
KGIN-TV Grand Island, Neb.
*WENH-TV Durham, N.H.
WPIX New York
WTVU Durham, N.C.
KTHI-TV Fargo, N.D.
KXMD-TV Williston, N.D.
WTOU-TV Toledo, Ohio
*KOED-TV Tulsa, Okla.
KCBY-TV Coos Bay, Ore.
WPXI Pittsburgh
KHSD-TV Lead, S.D.
*KQSD-TV Lowry, S.D.
KELO-TV Sioux Falls, S.D.
WJHL-TV Johnson City, Tenn.
*WLJT-TV Lexington, Tenn.
KTVT Fort Worth
KHOU-TV Houston
KCBT-TV Lubbock, Tex.
*KBYU-TV Provo, Utah
KSTW Tacoma, Wash.
WLUK-TV Green Bay, Wis.
WKBM-TV Caguas, P.R.

Channel 12 (204-210 mhz)

WSPA-TV Montgomery, Ala.
KPNX-TV Mesa, Ariz.
KHSL-TV Chico, Calif.
KCOY-TV Santa Maria, Calif.
KBDI-TV Broomfield, Colo.
*WHYY-TV Wilmington, Del.
WTLV Jacksonville, Fla.
WPEC West Palm Beach, Fla.
WRDW-TV Augusta, Ga.
KMAU-TV Wailuku, Hawaii
*KUID-TV Moscow, Idaho
*WILL-TV Urbana, Ill.
*KIIN-TV Iowa City
KTVH Hutchinson, Kan.
*WYES-TV New Orleans
KSLA-TV Shreveport, La.
*WMEB-TV Orono, Me.
WJRT-TV Flint, Mich.
KEYC-TV Mankato, Minn.
KNMT Walker, Minn.
*WMAE Booneville, Miss.
WJTV Jackson, Miss.
KFVS-TV Cape Girardeau, Mo.
KODE-TV Joplin, Mo.

KTVG Helena, Mont.
*KUON-TV Lincoln, Neb.
*KRNE-TV Merriman, Neb.
KMCC-TV Clovis, N.M.
KIVA-TV Farmington, N.M.
WBNG-TV Binghamton, N.Y.
WCTI-TV New Bern, N.C.
WXTI Winston-Salem, N.C.
KXMB-TV Bismarck, N.D.
WKRC-TV Cincinnati
KXII Ardmore, Okla.
*KWET Cheyenne, OK.
KPTV Portland, Ore.
WICU-TV Erie, Pa.
WPRI-TV Providence, R.I.
WDEF-TV Chattanooga
KTXS-TV Abilene, Tex.
KBBT Beaumont, Tex.
KSAT-TV San Antonio, Tex.
KTXS-TV Sweetwater, Tex.
WWBT Richmond, Va.
KVOS-TV Bellingham, Wash.
WBOY-TV Clarksburg, W. Va.
WISN-TV Milwaukee
WAOE-TV Rhinelander, Wis.
KSGW-TV Sheridan, Wyo.
*KGTG Agana, Guam
WOLE-TV Aguadilla, P.R.
*WTJX-TV Charlotte Amalie, V.I.

Channel 13 (210-216 mhz)

WVTM-TV Birmingham, Ala.
KIMO Anchorage
KIFW-TV Sitka, Alaska
KOLD-TV Tucson, Ariz.
KYLE-TV Yuma, Ariz.
*KAFT Fayetteville, Ark.
*KEET Eureka, Calif.
KCOF Los Angeles
KQVR Stockton, Calif.
KRDO-TV Colorado Springs
WMBB Panama City, Fla.
WTVT Tampa, Fla.
WMAZ-TV Macon, Ga.
KHVO Hilo, Hawaii
KIKU-TV Honolulu
WREX-TV Rockford, Ill.
WTHR Indianapolis
WHO-TV Des Moines, Iowa
KUPK-TV Garden City, Kan.
WIBW-TV Topeka, Kan.
WBKO Bowling Green, Ky.
*KLTN Monroe, La.
*WMEB-TV Calais, Me.
WGAN-TV Portland, Me.
WJZ-TV Baltimore
WZZM-TV Grand Rapids, Mich.
*WMCB-TV Marquette, Mich.
WIRT Hingham, Minn.
WLOX-TV Biloxi, Miss.
KRGC Jefferson City, Mo.
KECI-TV Missoula, Mont.
*KTNE-TV Alliance, Neb.
KHGI-TV Kearney, Neb.
KTNV-TV Las Vegas
*WNEN Newark, N.J.
KGGM-TV Albuquerque, N.M.
WNYT Albany, N.Y.
WOKR Rochester, N.Y.
WLOS-TV Asheville, N.C.
*KFME Fargo, N.D.
KXMC-TV Minot, N.D.
WTVG Toledo, Ohio
*KETA Oklahoma City
KVAL-TV Eugene, Ore.
*KTVR La Grande, Ore.
*WQED Pittsburgh
WBTW Florence, S.C.
*KPSD-TV Eagle Butte, S.D.
KSFY-TV Sioux Falls, S.D.
WHBQ-TV Memphis
*KERA-TV Dallas
*KCOS El Paso
KTRK-TV Houston
KTVL Laredo, Tex.
KLBK-TV Lubbock, Tex.
WVEC-TV Hampton, Va.
WSET Lynchburg, Va.
KCPQ Tacoma, Wash.
WOWK-TV Huntington, W.Va.
WEAU-TV Eau Claire, Wis.
KTUX Rock Springs, Wyo.
WSTE Fajardo, P.R.

UHF Stations

Channel 14 (470-476 mhz)

KDVT San Francisco, Calif.

*WABW-TV Pelham, Ga.
WFIE-TV Evansville, Ind.
KMEG Sioux City, Iowa
KLA West Monroe, La.
*WCMU-TV Mount Pleasant, Mich.
*WMAW Meridian, Miss.
KGSW Albuquerque, N.M.
WHKY-TV Hickory, N.C.
*WPTO Oxford, Ohio
KTBO Oklahoma City, Okla.
*WEBA-TV Allendale, S.C.
KJTV Amarillo, Tex.
KCIC El Paso, Tex.
WSCO Suring, Wis.
KCWY-TV Casper, Wyo.

Channel 15 (476-482 mhz)

WOWL-TV Florence, Ala.
WAVO Mobile, Ala.
KNXV-TV Phoenix
*KPBS-TV San Diego
*WDCO-TV Cochran, Ga.
WICD Champaign, Ill.
WANE-TV Fort Wayne, Ind.
*WKPC-TV Louisville, Ky.
KADN Lafayette, La.
*KAVT-TV Austin, Minn.
WXVT Greenville, Miss.
KPOB-TV Poplar Bluff, Mo.
*WHED-TV Hanover, N.H.
WLYH-TV Lancaster, Pa.
WPDE-TV Florence, S.C.
*KAMU-TV College Station, Tex.
*WHRO-TV Hampton-Norfolk, Va.
*WBRV-TV Roanoke, Va.
KCKA Centuria, Wash.
WTAU-TV Parkersburg, W.Va.
WMTV Madison, Wis.

Channel 16 (482-488 mhz)

WTKW Key West, Fla.
*WUSF-TV Tampa, Fla.
*WUSI-TV Olney, Ill.
WNDU-TV South Bend, Ind.
WBOC-TV Salisbury, Md.
WAPT Jackson, Miss.
KTVJ Joplin, Mo.
*WNPE-TV Watertown, N.Y.
*WPTD-TV Kettering, Ohio
KMTR-TV Eugene, Ore.
*WQEX Pittsburgh
WNEP-TV Scranton, Pa.
*WJWJ-TV Beaufort, S.C.
WGGG-TV Greenville, S.C.
*KDSO-TV Aberdeen, S.D.
New-TV Jackson, Tenn.
*KEDT Corpus Christi, Tex.

Channel 17 (488-494 mhz)

KPWR-TV Bakersfield, Calif.
WJKS-TV Jacksonville, Fla.
*WLRN-TV Miami
WTBS Atlanta
WAND Decatur, Ill.
WTVO Rockford, Ill.
*KTCI-TV St. Paul
*WMAU Bude, Miss.
KCBJ-TV Columbia, Mo.
*WNED-TV Buffalo, N.Y.
*WMHT Schenectady, N.Y.
*WUNE-TV Linville, N.C.
WJAN Canton, Ohio
WPHL-TV Philadelphia
WZTV Nashville

Channel 18 (494-500 mhz)

WDHN Dothan, Ala.
*KMTF Fresno, Calif.
KSCI San Bernardino, Calif.
WHCT-TV Hartford, Conn.
*WCLP-TV Chatsworth, Ga.
WLFJ-TV Lafayette, Ind.
WLEX-TV Lexington, Ky.
KLTU-TV Lake Charles, La.
*WMAV Oxford, Miss.
WETM-TV Elmira, N.Y.
*WNPI-TV Norwood, N.Y.
WCCB Charlotte, N.C.
WHIZ-TV Zanesville, Ohio
*KLRU-TV Austin, Tex.
KDCC-TV Midland, Tex.
WQOW Eau Claire, Wis.
WYTV Milwaukee

Channel 19 (500-506 mhz)

WHNT-TV Huntsville, Ala.
 *KTEJ Jonesboro, Ark.
 KCSO-TV Modesto, Calif.
 WJFT-TV Albany, Ga.
 WRAU-TV Peoria, Ill.
 WXIX-TV Newport, Ky.
 WDCD Adams, Mass.
 *WUCM-TV University Center, Mich.
 *WMAH Biloxi, Miss.
 *KCPT Kansas City, Mo.
 *KXNE-TV Norfolk, Neb.
 WJNL-TV Johnstown, Pa.
 WLTX Columbia, S.C.
 WKPT-TV Kingsport, Tenn.
 New-TV Nacogdoches, Tex.
 KXIX Victoria, Tex.
 KEPR-TV Pasco, Wash.
 WXOW-TV La Crosse, Wis.

Channel 20 (506-512 mhz)

WCOV-TV Montgomery, Ala.
 KTZO San Francisco
 WATR-TV Waterbury, Conn.
 WDCA-TV Washington
 WBBH-TV Fort Myers, Fla.
 WCJB Gainesville, Fla.
 *WCES-TV Wrens, Ga.
 KHAI Honolulu, Hawaii
 *WCME Chicago
 WICS Springfield, Ill.
 *WFI Indianapolis
 New-TV New Orleans.
 WXON Detroit
 WUTR Utica, N.Y.
 *WOUB-TV Athens, Ohio
 KEQO Enid, Okla.
 WCPT-TV Crossville, Tenn.
 KTXH Houston, Tex.
 KSTU Salt Lake City, Utah
 *WVTB St. Johnsbury, Vt.
 New-TV Tacoma, Wash.
 *WHRM-TV Wausau, Wis.

Channel 21 (512-518 mhz)

WTO Birmingham, Ala.
 WPMI Mobile, Ala.
 KPAZ-TV Phoenix
 KFTV Hanford, Calif.
 WPTA Roanoke, Ind.
 *KTIN Fort Dodge, Iowa
 *WKMU Murray, Ky.
 *KOZK Springfield, Mo.
 KAME-TV Reno, Nev.
 *WLIW Garden City, N.Y.
 *WXXI Rochester, N.Y.
 WHNS Asheville, N.C.
 WFMY-TV Youngstown, Ohio
 KTVZ Bend, Ore.
 WHP-TV Harrisburg, Pa.
 KTXA Fort Worth, Tex.
 *WHA-TV Madison, Wis.

Channel 22 (518-524 mhz)

KWHY-TV Los Angeles
 WCLF Clearwater, Fla.
 WJCL Savannah, Ga.
 WSBT-TV South Bend, Ind.
 *WVUT Vincennes, Ind.
 *WKPI Pikeville, Ky.
 *WAPB Annapolis, Md.
 WWLP Springfield, Mass.
 *KRWG-TV Las Cruces, N.M.
 WLFL-TV Raleigh, N.C.
 WKEF Dayton, Ohio
 KECH Salem, Ore.
 WPTT-TV Pittsburgh
 WDAU-TV Scranton, Pa.
 *WCTE Cookeville, Tenn.
 WEZF-TV Burlington, Vt.
 KUAA Spokane, Wash.

Channel 23 (524-530 mhz)

KERO-TV Bakersfield, Calif.
 WLV Miami
 *WSRE Pensacola, Fla.
 WIFR-TV Freeport, Ill.
 *WKZT Elizabethtown, Ky.
 *WKAR-TV East Lansing, Mich.
 KTMAT-TV Minneapolis
 *WMAO Greenwood, Miss.
 *WNJS Camden, N.J.
 KLKK-TV Albuquerque, N.M.

WAKR-TV Akron, Ohio
 KOKI Tulsa, Okla.
 WHMC Conway, S.C.
 KVEO Brownsville, Tex.
 *WCVE-TV Richmond, Va.
 KNDO Yakima, Wash.

Channel 24 (530-536 mhz)

KLNN Fort Smith, Ark.
 KSEE Fresno, Calif.
 *KVCR-TV San Bernardino, Calif.
 *WEDH Hartford, Conn.
 *WMFE-TV Orlando, Fla.
 WWLG Macon, Ga.
 *WQPT Moline, Ill.
 *KYIN Mason City, Iowa
 KLPB-TV Lafayette, La.
 *KLTs Shreveport, La.
 WKUL-TV Baltimore
 WHTV Meridian, Miss.
 KNLC St. Louis
 *WCNY-TV Syracuse, N.Y.
 WDHO-TV Toledo, Ohio
 WJET-TV Erie, Pa.
 WPTY-TV Memphis, Tenn.
 KVUE Austin, Tex.
 *KIDZ-TV Wichita Falls, Tex.
 *WWVU-TV Morgantown, W.Va.
 WCGV Milwaukee
 WSJN-TV San Juan, P.R.

Channel 25 (536-542 mhz)

*WHIQ Huntsville, Ala.
 *WACS-TV Dawson, Ga.
 WEEK-TV Peoria, Ill.
 WEHT Evansville, Ind.
 *WKAS Ashland, Ky.
 New-TV Alexandria, La.
 KLPA-TV Baton Rouge, La.
 WHAG-TV Hagerstown, Md.
 WNEU-TV Boston
 WEYI-TV Saginaw, Mich.
 *WNYE-TV New York
 *WUNK-TV Greenville, N.C.
 *WVIZ-TV Cleveland
 *KOKH-TV Oklahoma City
 WOLO-TV Columbia, S.C.
 New-TV Victoria, Tex.
 KNDU Richland, Wash.

Channel 26 (542-548 mhz)

*WAIQ Montgomery, Ala.
 KTSF-TV San Francisco
 KMPH Visalia, Calif.
 *WETA-TV Washington
 WEVU Naples, Fla.
 WAGT-TV Augusta, Ga.
 KSHO Honolulu, Hawaii
 WCIU-TV Chicago
 WISU Terre Haute, Ind.
 WGNO-TV New Orleans
 *WMEG-TV Bideford, Me.
 *KYNE-TV Omaha
 *WUNL-TV Winston-Salem, N.C.
 WTJC Springfield, Ohio
 WTVK Knoxville, Tenn.
 KRIV-TV Houston
 WLRE Green Bay, Wis.

Channel 27 (548-554 mhz)

WECA-TV Tallahassee, Fla.
 WDDD Marion, Ill.
 *KSN Sioux City, Iowa
 KTSB Topeka, Kan.
 WKYT-TV Lexington, Ky.
 *WLPB-TV Baton Rouge
 WSMW-TV Worcester, Mass.
 KMTC Springfield, Mo.
 WKBN-TV Youngstown, Ohio
 WHTM-TV Harrisburg, Pa.
 *WRJA-TV Sumter, S.C.
 KTWs-TV Dallas, Tex.
 WYAH-TV Portsmouth, Va.
 WKOW-TV Madison, Wis.

Channel 28 (554-560 mhz)

*KCT Los Angeles
 *WJSP-TV Columbus, Ga.
 WJUV Elkhart, Ind.
 *WCPB Salisbury, Md.
 WFUM Flint, Mich.

WPTF-TV Durham, N.C.
 WBRE-TV Wilkes-Barre, Pa.
 KORO Corpus Christi, Tex.
 KAMC Lubbock, Tex.
 *WVER Rutland, Vt.
 New-TV Spokane, Wash.
 *WHWC-TV Menomonee, Wis.

Channel 29 (560-566 mhz)

KTPV Fayetteville, Ark.
 KBAK-TV Bakersfield, Calif.
 WFLX West Palm Beach, Fla.
 *WKPD Paducah, Ky.
 *WKSO Somerset, Ky.
 WGTU Traverse City, Mich.
 WFBT-TV Minneapolis
 *WMAA Jackson, Miss.
 *KHNE-TV Hastings, Neb.
 WUTV Buffalo, N.Y.
 WTAFF-TV Philadelphia
 WTVU Greenville, S.C.
 WVIR-TV Charlottesville, Va.
 KIMA-TV Yakima, Wash.

Channel 30 (566-572 mhz)

KFSN-TV Fresno, Calif.
 KHOF-TV San Bernardino, Calif.
 WVIT-TV New Britain, Conn.
 New-TV Fort Meyers, Fla.
 *WAWS-TV Jacksonville, Fla.
 *WETV Atlanta
 *WTIU Bloomington, Ind.
 KDNL-TV St. Louis
 *WGTE-TV Toledo, Ohio
 *WNCS-TV Rock Hill, S.C.
 WBAH Memphis
 New-TV Milwaukee
 WRWR-TV San Juan, P.R.

Channel 31 (572-578 mhz)

WAAY-TV Huntsville, Ala.
 KRBK-TV Sacramento, Calif.
 WCGT Albany, Ga.
 WMBD-TV Peoria, Ill.
 WKOH Owensboro, Ky.
 KLAX Alexandria, La.
 *WWPB Hagerstown, Md.
 WIHT Ann Arbor, Mich.
 WNEU-TV Hanover, N.H.
 *WNYC-TV New York
 WUHF Rochester, N.Y.
 *WHLA-TV La Crosse, Wis.

Channel 32 (578-584 mhz)

WKAB-TV Montgomery, Ala.
 *KQEC San Francisco
 *WHMM Washington
 WFLD-TV Chicago
 *KBIN Council Bluffs, Iowa
 *KRIN Waterloo, Iowa
 WLKY-TV Louisville, Ky.
 KTAB Abilene, Tex.

Channel 33 (584-590 mhz)

WCFT-TV Tuscaloosa, Ala.
 KTVW-TV Phoenix, Ariz.
 WKJG-TV Fort Wayne, Ind.
 WRBT Baton Rouge
 New-TV Springfield, Mo.
 *WUNF-TV Asheville, N.C.
 WYTV Youngstown, Ohio
 *WITF-TV Hershey, Pa.
 *WJPM-TV Florence, S.C.
 KNBN-TV Dallas, Tex.
 *WETK Burlington, Vt.
 WTVZ Norfolk, Va.
 *WPBY-TV Huntington, W.Va.

Channel 34 (590-596 mhz)

KMEV-TV Los Angeles
 WTVX Fort Pierce, Fla.
 *WNIT-TV South Bend, Ind.
 WMGC-TV Binghamton, N.Y.
 *WOSU-TV Columbus, Ohio
 KGMC Oklahoma City, Okla.
 KJAA Lubbock, Tex.

Channel 35 (596-602 mhz)

KCBA Salinas, Calif.
 WOFL Orlando, Fla.
 *WKHA Hazard, Ky.
 *WKMA Madisonville, Ky.
 *WGVG Grand Rapids, Mich.
 WLIO Lima, Ohio
 WSEE Erie, Pa.
 *WRLK-TV Columbia, S.C.
 WRLH-TV Richmond, Va.
 KAPP Yakima, Wash.

Channel 36 (602-608 mhz)

*WFIQ Florence, Ala.
 KMIR-TV Palm Springs, Calif.
 KICU-TV San Jose, Calif.
 WATL-TV Atlanta
 *KHIN Red Oak, Iowa
 WTVQ-TV Lexington, Ky.
 WENY-TV Elmira, N.Y.
 WPCO-TV Charlotte, N.C.
 *WSBE-TV Providence, R.I.
 KTVV Austin, Tex.
 *WMVT Milwaukee
 *WLEF-TV Park Falls, Wis.

Channel 38 (614-620 mhz)

KVOF-TV San Francisco
 WKME-TV Seaford, Del.
 WLTV-TV Columbus, Ga.
 WFCF Chicago
 WBAK-TV Terre Haute, Ind.
 *WKMR Morehead, Ky.
 WSBK-TV Boston
 WOPC Altoona, Pa.
 WSWB Scranton, Pa.
 *WPNE Green Bay, Wis.

Channel 39 (620-626 mhz)

KCST-TV San Diego
 WQRF-TV Rockford, Ill.
 New-TV West Monroe, La.
 *WUNJ-TV Wilmington, N.C.
 *WLVT-TV Allentown, Pa.
 KXTX-TV Dallas
 KHTV Houston

Channel 40 (626-632 mhz)

WHMA-TV Annapolis, Md.
 KFPW-TV Fort Smith, Ark.
 KTBN-TV Fontana, Calif.
 KTXL Sacramento, Calif.
 WLXL-TV Sarasota, Fla.
 WHMB-TV Indianapolis
 KDUB-TV Dubuque, Iowa
 WGGB-TV Springfield, Mass.
 KWCV-TV St. Louis
 *WEDS-TV Berlin, N.H.
 WAATWildwood, N.J.
 WICZ-TV Binghamton, N.Y.
 WKFT Fayetteville, N.C.
 WPCB-TV Greensburg, Pa.
 WAIM-TV Anderson, S.C.
 WRJK-TV Bluefield, Va.

Channel 41 (632-638 mhz)

*WIIQ Demopolis, Ala.
 WCWB-TV Macon, Ga.
 WDRB-TV Louisville, Ky.
 WUHQ-TV Battle Creek, Mich.
 KXLI Minneapolis
 KSHB-TV Kansas City, Mo.
 WXTV Paterson, N.J.
 KGCT Tulsa, Okla.
 KWEX-TV San Antonio, Tex.
 *WVTA Windsor, Vt.

Channel 42 (638-644 mhz)

WBGM Birmingham, Ala.
 *WEIO Mobile, Ala.
 KFCB Concord, Calif.
 KESO-TV Palm Springs, Calif.
 *WHRs-TV Boynton Beach, Fla.
 WWPf West Palm Beach, Fla.
 *WTVI Charlotte, N.C.
 *WPBO-TV Portsmouth, Ohio
 KVEW Kennewick, Wash.

U.S. TV by Channel**Channel 43 (644-650 mhz)**

*WGIO Louisville, Ala.
 WKNA Melbourne, Fla.
 WBLN Bloomington, Ill.
 WKOI Richmond, Ind.
 WFWY Syracuse, N.Y.
 WUAB Lorain, Ohio
 KAUT Oklahoma City, Okla.
 WBSA-TV York, Pa.
 WGSE Myrtle Beach, S.C.
 WTMB-TV Tomah, Wis.

Channel 44 (650-656 mhz)

WNAL Gadsden, Ala.
 KBKH-TV San Francisco
 WTOG St. Petersburg, Fla.
 WVGa Valdosta, Ga.
 WSNs Chicago
 WAFV Evansville, Ind.
 *WGBX-TV Boston
 *WOUC-TV Cambridge, Ohio
 WTLW Lima, Pa.
 *WVIA-TV Scranton, Pa.
 WVEO Aguadilla, P.R.

Channel 45 (656-662 mhz)

WHFT Miami
 WBFF Baltimore
 WJTM-TV Winston-Salem, N.C.
 *WNEO-TV Alliance, Ohio
 KGPC Lawton, Okla.
 *WTCT Chattanooga

Channel 46 (662-668 mhz)

KBSA Guasti, Calif.
 KMST Monterey, Calif.
 WANX-TV Atlanta
 WHME-TV South Bend, Ind.
 *WKLE Lexington, Ky.
 *WSKG Binghamton, N.Y.
 *KNCT Belton, Tex.
 WLYJ Clarksburg, W.V.

Channel 47 (668-674 mhz)

KJEO Fresno, Calif.
 WXAQ-TV Jacksonville, Fla.
 *WTPV Peoria, Ill.
 WMDT Salisbury, Md.
 WNJU-TV Linden, N.J.
 *WVSN-TV Norton, Va.
 *KYVE-TV Yakima, Wash.

Channel 48 (674-680 mhz)

WAFF Huntsville, Ala.
 KSTS San Jose, Calif.
 WKBS-TV Burlington, N.J.
 *WCET Cincinnati
 KVEO McAllen, Tex.

Channel 49 (680-686 mhz)

*WBDW Bridgeport, Conn.
 *WIPB Muncie, Ind.
 *WLED-TV Littleton, N.H.
 *WEAO Akron, Ohio
 WGB-TV Red Lion, Pa.
 *WRET-TV Spartanburg, S.C.
 KLKRV Vancouver, Wash.

Channel 50 (686-692 mhz)

*KOCE-TV Huntington Beach, Calif.
 KFTY Santa Rosa, Calif.
 WCOR-TV Washington
 *WCAE St. John, Ind.
 KVFD-TV Fort Dodge, Iowa
 WKBD-TV Detroit
 KYFC Kansas City, Mo.
 *WNJM Montclair, N.J.

Channel 51 (692-698 mhz)

KUSI-TV San Diego
 WKID Fort Lauderdale, Fla.
 WOCA-TV Ocala, Fla.

U.S. TV by Channel, Canadian TV

WGGN-TV Sandusky, Ohio
WVTE Reading, Pa.
*WVPT Staunton, Va.

Channel 52 (698-704 mhz)

KBSC-TV Corona, Calif.
*WKON Owenton, Ky.
*WEKW-TV Keene, N.H.
*WNJT Trenton, N.J.
WSFJ Newark, Ohio
WMSY-TV Marion, Va.

Channel 53 (704-710 mhz)

KAIL Fresno, Calif.
*WEDN Norwich, Conn.
*WGBB Bowling Green, Ky.
WWAC Atlantic City
WPGH-TV Pittsburgh
*WNVT Goldvein, Va.

Channel 54 (710-716 mhz)

*KTEH San Jose, Calif.
*WCVN Covington, Ky.
WNUV-TV Baltimore, Md.
WFTI-TV Poughkeepsie, N.Y.
*WQLN Erie, Pa.

Channel 55 (716-722 mhz)

WIVE Leesburg, Fla.
WBHW Springfield, Ill.
WFFT-TV Fort Wayne, Ind.
WCPT-TV Crossville, Tenn.

Channel 56 (722-728 mhz)

KGOF Anaheim, Calif.
*KHJ Salinas, Calif.
WLVI-TV Cambridge, Mass.
*WTVS Detroit

Channel 57 (728-734 mhz)

WKYH-TV Hazard, Ky.

*WGBY-TV Springfield, Mass.
*WCFE-TV Plattsburgh, N.Y.
*WBGU-TV Lima, Ohio
WWSG-TV Philadelphia
WCCT-TV Columbia, S.C.
*WCVW Richmond, Va.

Channel 58 (734-740 mhz)

*KLCS Los Angeles
*WNJB New Brunswick, N.J.
*WUNG-TV Concord, N.C.

Channel 59 (740-746 mhz)

WTVU New Haven, Conn.

Channel 60 (746-752 mhz)

*KCSM-TV San Mateo, Calif.
*KZLN Harlingen, Tex.

Channel 61 (752-758 mhz)

WFGC Palm Beach, Fla.

WTSF Ashland, Ky.
WCLQ-TV Cleveland, Ohio
WRIP-TV Chattanooga

Channel 62 (758-764 mhz)

WGPR-TV Detroit
KEKR Kansas City, Mo.
WFCT Fayetteville, N.C.
*KTPS Tacoma, Wash.

Channel 63 (764-770 mhz)

WRNX Richmond, Va.

Channel 64 (770-776 mhz)

WBTI Cincinnati, Ohio
WSTG Providence, R.I.

Channel 65 (776-782 mhz)

*WEDY New Haven, Conn.
WRBV Vineland, N.J.

Channel 66 (782-788 mhz)

WFBN Joliet, Ill.
WGR-TV Marlborough, Mass.
WTKK-TV Manassas, Va.

Channel 67 (788-794 mhz)

*WMPB Baltimore
WSNL-TV Smithtown, N.Y.
WAKC Canton, Ohio

Channel 68 (794-800 mhz)

*WKMJ Louisville, Ky.
WQTV Boston
WTVG Newark, N.J.

Channel 69 (800-806 mhz)

WVEW Atlanta
WFMZ-TV Allentown, Pa.

Canadian TV by Calls

CBAFT Moncton, N.B.
CBAFT-2 Edmonton, N.B.
CBCP-TV-1 Shaunavon, Sask.
CBCP-TV-2 Cypress Hills, Sask.
CBCP-TV-3 Ponteix, Sask.
CBCT Charlottetown, P.E.I.
CBET Pine Point, NWT
*CBFT Windsor, Ont.
CBET Windsor, Ont.
CBFT-2 Temiscaming, Que.
CBFT Montreal, Que.
CBFT-2 Mont-Laurier, Que.
CBGAT Matane, Que.
CBHFT Halifax, N.S.
CBHFT-1 Yarmouth, N.S.
CBHFT-2 Mulgrave, N.S.
CBHFT-3 Sydney, N.S.
CBHFT-4 Cheticamp, N.S.
CBHT Halifax, N.S.
CBHT-3 Yarmouth, N.S.
CBHT-4 Shearbour, N.S.
CBIMT Iles-de-la-Madeleine, Que.
CBIT Sydney, N.S.
CBIT-1 Mulgrave, N.S.
CBIT-2 Cheticamp, N.S.
CBJET Chicoutimi, Que.
CBKFT Regina, Sask.
CBKFT-3 Debdon, Sask.
CBKFT-4 St. Brieux, Sask.
CBKFT-5 Zenon Park, Sask.
CBKFT-6 Gravelbourg, Sask.
CBKFT-9 Bellefleur, Sask.
CBKHT Keno Hill, Yukon
CBKST Saskatoon, Sask.
CBKST-1 Stranraer, Sask.
CBKT Regina, Sask.
CBKT-1 Moose Jaw, Sask.
CBKT-2 Willow Bunch, Sask.
CBLAT Geraldton, Ont.
CBLAT-1 Manitowadge, Ont.
CBLAT-3 Wawa, Ont.
CBLAT-4 Marathon, Ont.
CBLFT Toronto, Ont.
CBLFT-1 Sturgeon Falls, Ont.
CBLFT-2 Sudbury, Ont.
CBLFT-3 Timmins, Ont.
CBLFT-4 Kapuskasing, Ont.
CBLFT-5 Hearst, Ont.
CBLFT-6 Elliott Lake, Ont.
CBLT Toronto, Ont.
CBMT Montreal, Que.
CBNAT Grand Falls, Nfld.
CBNAT-1 Baie Verte, Nfld.
CBNAT-2 St. Anthony, Nfld.
CBNAT-9 Mount St. Margaret, Nfld.
*CBNLT Labrador City, Nfld.
CBNT St. John's, Nfld.
CBNT-1 Port Rexton, Nfld.
CBNT-2 Marytown, Nfld.
CBNT-3 Placentia, Nfld.
CBOT Ottawa, Ont.
CBOT Ottawa, Ont.
CBRT Calgary, Alta.
CBST Sept. Iles, Que.
CBUAT Trail, B.C.
CBUBT-1 Canal Flats, B.C.

CBUBT-2 Cranbrook, B.C.
CBUBT Vancouver, B.C.
CBUBT-2 Kamloops, B.C.
CBUT-3 Terrace, B.C.
CBUT Vancouver, B.C.
CBUT Quebec City, Que.
CBVT-2 La Tuque, Que.
CBWAT Kenora, Ont.
CBWBT Flin Flon, Man.
CBWCT Fort Frances, Ont.
CBWDT Dryden, Ont.
CBWFT Winnipeg, Man.
CBWFT-10 Brandon, Man.
CBWFT-4 St. Rose DuLac, Man.
CBWGT Fisher Branch, Man.
CBWST Dauphin, Man.
CBWT Winnipeg, Man.
CBWT-2 Lac du Bonnet, Man.
CBWYT Melfort, Man.
CBXAT Grande Prairie, Alta.
CBXAT-2 High Prairie, Alta.
CBXAT-3 Manning, Alta.
CBXFT Edmonton, Alta.
CBXFT-6 Fort McMurray, Alta.
CBXFT-8 Grande Prairie, Alta.
CBXT Edmonton, Alta.
CBXT-1 Athabasca, Alta.
CBXT-2 Whitecourt, Alta.
CBYT Corner Brook, Nfld.
CBYT-1 Stephenville, Nfld.
CBYT-3 Bonne Bay, Nfld.
CFAC-TV Calgary, Alta.
CFAC-TV Lethbridge, Alta.
CFCF-TV Montreal, Que.
CFCL-TV Timmins, Ont.
CFCL-TV-2 Kearns, Ont.
CFCL-TV-5 Malartic, Que.
CFCM-TV Quebec City, Que.
CFCN-TV Calgary, Alta.
CFCN-TV-1 Drumheller, Alta.
CFCN-TV-5 Lethbridge, Alta.
CFCN-TV-8 Medicine Hat, Alta.
CFER-TV Rimouski, Que.
CFER-TV-1 Sept. Iles, Que.
CFJC-TV Kamloops, B.C.
CFLA Goose Bay, Nfld.
CFMT-TV Toronto, Ont.
CFPL-TV London, Ont.
CFQC-TV Saskatoon, Sask.
CFQC-TV-1 Stranraer, Sask.
CFQC-TV-2 North Battleford, Sask.
CFRN-TV Edmonton, Alta.
CFRN-TV Slave Lake
CFRN-TV-1 Grand Prairie, Alta.
CFRN-TV-2 Peace River, Alta.
CFRN-TV-3 Whitecourt, Alta.
CFRN-TV-4 Ashmont, Alta.
CFRN-TV-6 Red Deer, Alta.
CFRN-TV-7 Loughheed, Alta.
CFRN-TV-8 Grouard Mission, Alta.
CFTK-TV Terrace, B.C.
CFTM-TV Montreal, Que.
CFTO-TV Toronto, Ont.
CFWHT Whitehorse, Yukon
*CFYK-TV Yellowknife, NWT
CHAK-TV Inuvik, NWT

CHAN-TV Vancouver, B.C.
CHAT-TV Medicine Hat, Alta.
CHAT-TV-1 Pivot, Alta.
CHAU-TV Carleton, Que.
CHBC-TV Kelowna, B.C.
CHCH-TV Hamilton, Ont.
CHCR-TV Campbellton, N.B.
CHEK-TV Victoria, B.C.
CHEK-TV-5 Campbell River, B.C.
CHEM-TV Trois Rivières, Que.
CHEX-TV Peterborough, Ont.
CHFD-TV Thunder Bay, Ont.
CHKL-TV Kelowna, B.C.
CHKL-TV Penticton, B.C.
CHKM-TV Kamloops, B.C.
CHLT-TV Sherbrooke, Que.
CHMT-TV Moncton, N.B.
CHNB-TV North Bay, Ont.
CHOT-TV Hull, Que.
CHOTV-TV St. Jerome, Que.
CHRO-TV Pembroke, Ont.
CHSJ-TV St. John, N.B.
CHSJ-TV-1 Bon Accord, N.B.
CHSS-TV Windsor, Sask.
*CICA-TV Toronto, Ont.
CICC-TV Yorkton, Sask.
CICC-TV-1 Wynyard, Sask.
CICI-TV Sudbury, Ont.
CICI-TV-1 Elliott Lake, Ont.
CICO-TV-18 London, Ont.
CICO-TV-24 Ottawa, Ont.
CICO-TV-28 Kitchener, Ont.
CICO-TV-59 Chatham, Ont.
*CICO-TV-9 Thunder Bay, Ont.
*CICO-TV-19 Sudbury, Ont.
*CICO-TV-20 Sault Ste Marie, Ont.
CICO-TV-32 Windsor, Ont.
CIEW-TV Carleton Place, Sask.
CIGF-TV Prince George, B.C.
CINT-Riviere du Loup, Que.
CITL-TV Lloydminster, Alta.
CITM-TV 100 Mile House, B.C.
CITO-TV Timmins, Ont.
CITO-TV-1 Kapuskasing, Ont.

CITO-TV-2 Keadins, Ont.
CITV-TV Edmonton, Alta.
CITV-TV Toronto, Ont.
*CIVA-TV Val D'Or Amos, Que.
*CIVM-TV Montreal, Que.
*CIVN-TV Rouyn, Que.
*CIVO-TV Hull, Que.
*CIVP-TV Chapeau, Que.
*CIVQ-TV Quebec City, Que.
CIVR-TV Rimouski, Que.
CIVS-TV Sherbrooke, Que.
CJAP-TV Argenteuil, Nfld.
CJBRT Rimouski, Que.
CJCB-TV Sydney, I.S.
CJCB-TV-1 Inverness, N.S.
CJCB-TV-2 Antigonish, N.S.
CJCH-TV Halifax, N.S.
CJCH-TV-1 Canning, N.S.
CJCH-TV-6 Caledonia, N.S.
CJCN-TV Grand Falls, Nfld.
CJDC-TV Dawson Creek, B.C.
CJDG-TV Lithium Mines, Que.
CJFB-TV Swift Current, Sask.
CJIC-TV Sault Ste. Marie, Ont.
CJOH-TV Ottawa, Ont.
CJOH-TV-6 Deseronto, Ont.
CJOH-TV-8 Cornwall, Ont.
CJON-TV St. John's, Nfld.
CJOX-TV-1 Grand Bank, Nfld.
CJPM-TV Chicoutimi, Que.
CJWN-TV Corner Brook, Nfld.
CKAM-TV Upsalquitch Lake, N.B.
CKBI-TV Prince Albert, Sask.
CKBI-TV-3 Greenwater Lake, Sask.
CKBI-TV-4 Nipawin, Sask.
CKBQ-TV Melfort, Sask.
CKCD-TV Campbellton, N.B.
CKCF-TV Regina, Sask.
CKCK-TV-1 Colgate, Sask.
CKCK-TV-2 Willow Bunch, Sask.
CKCO-TV Kitchener, Ont.
CKCO-TV-2 Georgian Bay, Ont.

CKCO-TV-3 Sarina, Ont.
CKCO-TV-4 Muskoka, Ont.
CKCW-TV Moncton, N.B.
CKCW-TV-1 Charlottetown, P.E.I.
CKCY-TV Sault Ste. Marie, Ont.
CKGN-TV Paris, Ont.
CKGN-TV-1 Windsor, Ont.
CKGN-TV-2 Bancroft, Ont.
CKGN-TV-22 Uxbridge, Ont.
CKGN-TV-26 Ottawa, Ont.
CKGN-TV-6 Hull, Ont.
CKKM-TV Oliver, B.C.
CKLT-TV St. John, N.B.
CKMC-TV Swift Current, Sask.
CKMI-TV Quebec City, Que.
CKMJ-TV Marquis, Sask.
CKNC-TV Sudbury, Ont.
CKNC-TV-1 Elliot Lake, Ont.
CKND-TV Winnipeg, Man.
CKNX-TV Wingham, Ont.
CKNY-TV North Bay, Ont.
CKOS-TV Yorkton, Sask.
CKPG-TV Prince George, B.C.
CKPR-TV Thunder Bay, Ont.
CKRD-TV Red Deer, Alta.
CKRD-TV-1 Coronation, Alta.
CKRN-TV Rouyn, Que.
CKRN-TV-3 Beaulieu/Fabre, Que.
CKRS-TV Jonquiere, Que.
CKRS-TV-3 Roberval, Que.
CKRT-TV Riviere du Loup, Que.
CKSA-TV Lloydminster, Alta.
CKSA-TV-2 Bonnyville, Alta.
CKSH-TV Sherbrooke, Que.
CKSR-TV Santa Rosa, B.C.
CKTM-TV Trois Rivières, Que.
CKTN-TV Trail, B.C.
CKVR-TV Barrie, Ont.
CKVU-TV Vancouver, B.C.
CKWS-TV Kingston, Ont.
CKX-TV Brandon, Man.
CKX-TV-1 Foxwarren, Man.
CKY-TV Winnipeg, Man.
CKYB-TV Brandon, Man.
New TV Trois-Rivières, Que.

Canadian TV by Channel

Channel 2

CFAC-TV Calgary, Alta.
CBXAT-2 High Prairie, Alta.
CKSA-TV Lloydminster, Alta.
CHBC-TV Kelowna, B.C.
CKPG-TV Prince George, B.C.
CBUT Vancouver, B.C.
CBWYT Melfort, Man.
CKCW-TV Moncton, N.B.
CBYT-3 Bonne Bay, Nfld.
CJOX-TV-1 Grand Bank, Nfld.
CBIT-2 Cheticamp, N.S.
CKGN-TV-2 Bancroft, Ont.
CKCO-TV-2 Georgian Bay, Ont.

23

CFCL-TV-2 Kearns, Ont.
CKCY-TV Sault Ste. Marie, Ont.
CKPR-TV Thunder Bay, Ont.
CBFT Montreal, Que.
CBCP-TV-2 Cypress Hills, Sask.
CKBQ-TV Melfort, Sask.
CKCK-TV Regina, Sask.

Channel 3

CFRN-TV Edmonton, Alta.
CFRN-TV-2 Peace River, Alta.
CITM-TV 100 Mile House, B.C.
CKKM-TV Oliver, B.C.
CFTK-TV Terrace, B.C.

CBWFT Winnipeg, Man.
CBWFT-4 Ste Rose du Lac, Man.
CJAP-TV Argenteuil, Nfld.
CBNAT-1 Baie Verte, Nfld.
CBHT Halifax, N.S.
CBHFT-1 Yarmouth, N.S.
CKVR-TV Barrie, Ont.
CICI-TV-1 Elliot Lake, Ont.
CITO-TV Timmins, Ont.
CKRN-TV-3 Beaulieu/Fabre, Que.
CBVT-2 La Tuque, Que.
CBFT-2 Mont-Laurier, Que.
CJBRT Rimouski, Que.
CBCP-TV-3 Ponteix, Sask.
CFQC-TV-1 Stranraer, Sask.

Channel 4

CFCN-TV Calgary, Alta.
CITL-TV Lloydminster, Alta.
CHAT-TV-1 Pivot, Alta.
CFJC-TV Kamloops, B.C.
CKYB-TV Brandon, Man.
CBWT-2 Lac du Bonnet, Man.
CHCR-TV Campbellton, N.B.
CHSJ-TV Saint John, N.B.
CJCN-TV Grand Falls, Nfld.
CJCB-TV Sydney, N.S.
CHNB-TV North Bay, Ont.
CBOT Ottawa, Ont.
CHFD-TV Thunder Bay, Ont.
CFM-TV Quebec City, Que.
CFCM-TV Rouyn, Que.
*CHOY-TV St. Jerome, Que.
CKBI-TV-3 Greenwater Lake, Sask.
CBKT-1 Moose Jaw, Sask.
CBET Pine Point, NWT

Channel 5

CBXT Edmonton, Alta.
CJDC-TV Dawson Creek, B.C.
CHKL-TV Kelowna, B.C.
CKX-TV Brandon, Man.
CBYT Corner Brook, Nfld.
CBNT-3 Marystown, Nfld.
CJCH-TV Halifax, N.S.
CBIT Sydney, N.S.
CBWOT Fort Frances, Ont.
CHRO-TV Pembroke, Ont.
CJIC-TV Sault Ste Marie, Ont.
CICI-TV Sudbury, Ont.
CBLT Toronto, Ont.
CHAU-TV Carleton, Que.
CFCL-TV-5 Malartic, Que.
CKMI-TV Quebec City, Que.
CKBI-TV Prince Albert, Sask.
CJFB-TV Swift Current, Sask.
CKOS-TV Yorkton, Sask.

Channel 6

CHAT-TV Medicine Hat, Alta.
CKRD-TV Red Deer, Alta.
CHKM-TV Kamloops, B.C.
CHEK-TV Victoria, B.C.
CBWT Winnipeg, Man.
CHSJ-TV-1 Bon Accord, N.B.
CBNAT-4 St. Anthony, Nfld.
CJON-TV St. John's, Nfld.
CJCH-TV-6 Caledonia, N.S.
CJCB-TV-1 Inverness, N.S.
CJOH-TV-2 Deseronto, Ont.
CKGN-TV-6 Ottawa, Ont.
CKGN-TV Paris, Ont.
CFCL-TV Timmins, Ont.
CJPM-TV Chicoutimi, Que.
CKGN-TV-6 Hull, Que.
CBMT Montreal, Que.
CFQC-TV-2 North Battleford, Sask.

CKCK-TV-2 Willow Bunch, Sask.
CHSS-TV Wynyard, Sask.
CHAK-TV Inuvik, NWT
CFWH-TV Whitehorse, Yukon

Channel 7

CFAC-TV Lethbridge, Alta.
CFRN-TV-7 Loughheed, Alta.
CKY-TV Winnipeg, Man.
CKCD-TV Campbellton, N.B.
CHMT-TV Moncton, N.B.
CBHFT-2 Mulgrave, N.S.
CKNC-TV-1 Elliot Lake, Ont.
CBLFT-5 Hearst, Ont.
CBLFT-1 Sturgeon Falls, Ont.
CJJD-TV Lithiums Mines, Que.
CKRT-TV Riviere du Loup, Que.
CHLT-TV Sherbrooke, Que.
CIEW-TV Carlyle Lake, Sask.
CKMJ-TV Marquis, Sask.
CKBI-TV-4 Nipawin, Sask.
CBCP-TV-1 Shaunavon, Sask.
CBKFT-4 St. Brieux, Sask.

Channel 8

CBXT-1 Athabasca, Alta.
CFCN-TV-8 Medicine Hat, Alta.
CFRN-TV-6 Red Deer, Alta.
CKTN-TV Trail, B.C.
CHAN-TV Vancouver, B.C.
CBWST Dauphin, Man.
CFLA-TV Goose Bay, Nfld.
CBNT St. John's, Nfld.
CBYT-1 Stephenville, Nfld.
CJOH-TV-8 Cornwall, Ont.
CBWAT Kenora, Ont.
CBLAT-1 Manitowadge, Ont.
CKNX-TV Whangam, Ont.
CKCW-TV-1 Charlottetown, P.E.I.
CKRS-TV-3 Roberval, Que.
*CIVN-TV Rouyn, Que.
CHEM-TV Trois Rivières, Que.
CFQC-TV Saskatoon, Sask.
*CFYK-TV Yellowknife, NWT

Channel 9

CKSA-TV-2 Bonnyville, Alta.
CBRT Calgary, Alta.
CFRN-TV Slave Lake, Alta.
CBXT-2 Whitecourt, Alta.
CKND-TV Winnipeg, Man.
CKLT-TV St. John, N.B.
CBNAT-9 Mount St. Margaret, Nfld.
CJCB-TV-2 Antigonish, N.S.
CBWDT Dryden, Ont.
CBOFT Ottawa, Ont.
CKNC-TV Sudbury, Ont.
*CICO-TV-9 Thunder Bay, Ont.
CBLFT-3 Timmins, Ont.
CFTO-TV Toronto, Ont.

CBAT-3 Wawa, Ont.
CBET Windsor, Ont.
CBGAT Matane, Que.
CINT-Riviere du Loup, Que.
CKSH-TV Sherbrooke, Que.
CBKST Regina, Sask.
CBKST-1 Stranraer, Sask.

Channel 10

CKRD-TV-1 Coronation, Alta.
CBXAT Grande Prairie, Alta.
CBUBT-7 Cranbrook, B.C.
CHKL-TV Penticton, B.C.
CBWGT Fisher Branch, Man.
CBWBT Flin Flon, Man.
CJWN-TV Corner Brook, Nfld.
CJCH-TV-1 Canning, N.S.
CBHFT-4 Cheticamp, N.S.
CITO-TV-1 Kapuskasing, Ont.
CFPL-TV London, Ont.
CKNY-TV North Bay, Ont.
CFMT-TV Montreal, Que.
CBKT-2 Willow Bunch, Sask.
CICC-TV Yorkton, Sask.

Channel 11

CBXFT Edmonton, Alta.
CBUFT-3 Terrace, B.C.
CBUAT Trail, B.C.
CKX-TV-1 Foxwarren, Man.
CBAFT Moncton, N.B.
CBNAT Grand Falls, Nfld.
CBHT-4 Sheet Harbour, N.S.
CBHT-3 Yarmouth, N.S.
CHCH-TV Hamilton, Ont.
CITO-TV-2 Kearns, Ont.
CKWS-TV Kingston, Ont.
CBLAT-4 Marathon, Ont.
CKCO-TV-4 Muskoka, Ont.
CBVT Quebec City, Que.
CFER-TV Rimouski, Que.
CFER-TV-1 Sept Iles, Que.
CBKST Saskatoon, Sask.

Channel 12

CFRN-TV-4 Ashmont, Alta.
CFCN-TV-1 Drumheller, Alta.
CBXFT-6 Fort McMurray, Alta.
CBXAT-3 Manning, Alta.
CFRN-TV-3 Whitecourt, Alta.
CBUBT-1 Canal Flats, B.C.
CJFG-TV Prince George, B.C.
CKAM-TV Upsalquitch Lake, N.B.
CBNT-2 Placentia, Nfld.
CBIT-1 Mulgrave, N.S.
CBLFT-6 Elliot Lake, Ont.
CBLFT-4 Kapuskasing, Ont.
CHEX-TV Peterborough, Ont.
CKRS-TV Jonquiere, Que.
CBMT Iles-de-la-Madeleine, Que.
CFCF-TV Montreal, Que.
CBFT-2 Temiscaming, Que.

*CIVA-TV Val D'Or Amos, Que.
CKCK-TV-1 Colgate, Sask.
CICC-TV-1 Wynyard, Sask.
CKMC-TV Swift Current, Sask.

Channel 13

CITV-TV Edmonton, Alta.
CFRN-TV-1 Grande Prairie, Alta.
CFCN-TV-5 Lethbridge, Alta.
CBAFT-2 Edmundston, N.B.
*CBNLT Labrador City, Nfld.
CBNT-1 Port Rexton, Nfld.
CBHFT-3 Sydney, N.S.
CBLAT Geraldton, Ont.
CKCO-TV Kitchener, Ont.
CJOH-TV Ottawa, Ont.
CBLFT-2 Sudbury, Ont.
CBCT Charlottetown, P.E.I.
CBST Sept Iles, Que.
CKTM-TV Trois Rivières, Que.
CBKFT Regina, Sas.
CBKHT Keno Hill, Yukon

Channel 15

CIVQ-TV Quebec City, Que.

Channel 17

CIVM-TV Montreal, Que.

Channel 18

CFRN-TV-8 Grouard Mission, Alta.
CICO-TV-18 London, Ont.

Channel 19

CBXFT-8 Grande Prairie, Alta.
*CICO-TV-19 Sudbury, Ont.
*CICA-TV Toronto, Ont.

Channel 20

CICO-TV-20 Sault Ste. Marie, Ont.

Channel 21

CKVU-TV Vancouver, B.C.
CBWFT-10 Brandon, Man.
CBKFT-5 Zenon Park, Sask.

Channel 22

CKGN-TV-22 Uxbridge, Ont.
CKGN-TV-1 Windsor, Ont.
CIVR-TV Rimouski, Que.
CBKFT-3 Debdon, Sask.

Channel 23

*CIVP-TV Chapeau, Que.

Channel 24

CICO-TV-24 Ottawa, Ont.

Canadian TV, TV Assignments

CIVS-TV Sherbrooke, Que.

Channel 25

CBLFT Toronto, Ont.

Channel 26

CBUFT Vancouver, B.C.
CBKFT-9 Bellegarde, Sask.

Channel 28

CICO-TV-28 Kitchener-Paris, Ont.

Channel 29

CKGN-TV-29 Sarnia, Ont.

Channel 30

CIVO-TV Hull, Que.

Channel 32

CBHFT Halifax, N.S.
CICO-TV-32 Windsor, Ont.

Channel 39

CBKFT-6 Gravelbourg, Sask.

Channel 40

CHOT-TV Hull, Que.

Channel 42

CKCO-TV-3 Sarina, Ont.

Channel 45

New TV Trois-Rivières, Que.

Channel 47

CFMT-TV Toronto, Ont.

Channel 50

CBUFT-2 Kamloops, B.C.

Channel 58

CBJET Chicoutimi, Que.
Channel 59
CICO-TV-59 Chatham, Ont.

Channel 78

CBEFT Windsor, Ont.

Channel 79

CITY-TV Toronto, Ont.

Channel 83

CKSR-TV Santa Rosa, B.C.

TV Assignments

Note—UHF and VHF TV assignments have been made by the FCC to the following cities. A plus or minus after a channel indicates that a station occupying the channel must operate with its carrier frequencies offset 10 kilohertz above or below, respectively, the normal carrier frequencies.

Asterisks (*) indicate channels reserved for non-commercial use. Footnotes: 1) Following the decision in Docket 18261 (amendment of rules regarding geographic reallocation of channels 14-20 to land mobile radio in the 25 largest urbanized areas of the U.S.) channels so indicated will not be available for use until further action by the FCC. 2) This channel is not available for Elgin, Ill., unless FCC determines it is not needed at Joliet, Ill. 3) This channel is not available for Asbury Park, N.J., unless FCC determines it is not needed at New Brunswick, N.J. 4) Channel 15 will not be available for television use until further action by the FCC. 5) Stations using these assignments shall limit radiation toward stations on the same channel in Puerto Rico. 6) Operation on this channel is subject to the conditions, terms, and requirements set out in the report and order in docket 19075, RM-1645, adopted Jan. 5, 1972, released Jan. 7, 1972. FCC-72-19, (As of August, 1980)

Alabama

Andalusia—*2—
Anniston—40—
Birmingham—6—, *10—, 13—, 21—, 42+, *62+, 68+
Demopolis—*41
Dothan—4, 18, *39+, 60—
Florence—15, 26, *36—
Gadsden—44+, 60
Huntsville/Decatur—19, *25+, 31+, 48, 54
Mobile—5+, 10+, 15+, 21+, *31, *42
Montgomery—12, 20, *26+, 32, 45—
Murfreesboro—*7—, *16—
Opelika—66
Selma—8, 29—
Tuscaloosa—17, 33, *39—
Tusculum—47—

Alaska

Anchorage—2—, 4—, *7—, 11, 13—

Bethel—*4
Dillingham—10
Fairbanks—2+, 4+, 7+, *9+, 11+, 13+
Juneau—*3, 8, 10
Ketchikan—2, 4, *9
Seward—3—, 9—
Sitka—13

Arizona

Ajo—*23—
Coolidge—*43
Douglas—3, *28
Flagstaff—2, 13, *16
Globe—*14+
Holbrook—*18+
Kingman—6—, *14—
McNary—*22+
Mesa—12—
Nogales—*16+
Page—*17
Parker—*17—
Phoenix—3+, 5—, *8+, 10—, 15—, 21, 33, *39
Prescott—7, *19
Safford—*23+
Sierra Vista—58

Tucson—4—, *6+, 9—, 13—, 18—, *27—, 40
Tucson-Nogales—116
Yuma—11—, 13+, *16—

Arkansas

Arkadelphia—*9+
Batesville—*17
El Dorado—10—, 18—, *30+
Fayetteville—*13—, 29+
Fort Smith—5—, 24+, 40—
Harrison—*31+
Hot Springs—*20, 26
Jonesboro—8—, *19+
Little Rock—2, 4, 7, 11, 16—, *38
Mountain View—*6—
Pine Bluff—25—, 38—
Russellville—*28+

California

Alturas—13+
Anaheim—56—
Bakersfield—17, 23—, 29, *39—

TV Assignments

Barstow—*35+
 Bishop—*14-
 Blythe—*22-
 Chico—12-, *181, 24+,
 *30-
 Coalinga—*27-
 Concord—42
 Corona—52
 Cotati—*22-
 El Centro—7+, 9+
 Eureka—3-, 8-, *13-
 Fort Bragg—*17+
 Fresno—*18+, 24, 30+,
 43, 47, 53, 59
 Hanford—21
 Indio—19+
 Los Angeles—2, 4, 5, 7,
 9, 11, 13, 22, 28, 34,
 58-, 68-
 Modesto—19-, 23+
 Oxnard—63+
 Palm Springs—36-, 42
 Redding—7, 9, 16+
 Ridgecrest—25
 Riverside—46, 62
 Sacramento—3, 6, 10,
 15+, 31-, 40-
 Salinas—Monterey—8+,
 *35-, 46-, *56, 67-
 San Bernardino—18-,
 24-, 30
 San Diego—8, 10, *15,
 39, 51, 69
 San Francisco—2+, 4-,
 5+, 7-, *9+, 14+, 20,
 26-, *32+, 38, 44
 San Jose—11+, 36,
 48-, *54, 65
 San Luis Obispo—6+,
 15+
 San Mateo—*60
 Santa Ana—40, *50-
 Santa Barbara—3-, 141,
 201, 32
 Santa Cruz—16-
 Santa Maria—12+
 Santa Rosa—50, 62
 Stockton—13+, 58, 64
 Susanville—14
 Tulare—26+
 Vallejo—Fairfield—66
 Ventura—16+
 Visalia—*49
 Watsonville—25+
 Yreka City—20+

Colorado

Alamosa—*16
 Boulder—12, 14
 Colorado Springs—11,
 13, 21
 Craig—16+
 Denver—2, 4-, 6-, 7,
 9-, 20, 31, 41
 Durango—6+, 20-
 Fort Collins—22-
 Glenwood Springs—3-,
 *19+
 Grand Junction—5-,
 8-, 18+
 Gunnison—17-
 La Junta—22+
 Lamar—12-, 14-
 Leadville—15-
 Montrose—10+, 22
 Pueblo—5, 8, 26+, 32-
 Salida—23+
 Sterling—3, 18+
 Trinidad—24

Connecticut

Bridgeport—43-, 49-
 Hartford—3+, 18-, 24,
 61+
 New Britain—30+
 New Haven—8+, 59+,
 55
 New London—26+
 Norwich—53
 Waterbury—20

Delaware

Dover—34
 Seaford—38, *64-
 Wilmington—12, 61

District of Columbia

Washington—4-, 5-,
 7+, 9, 14-, 20+, 26-,
 32+, 50

Florida

Boca Raton—*63
 Bradenton—19
 Clearwater—22
 Cocoa—18-, 52
 Daytona Beach—2-, 26
 Fort Lauderdale—51
 Fort Myers—11+, 20+,
 30
 Fort Pierce—21-, 34
 Fort Walton Beach—35,
 52+
 Gainesville—5-, 20
 Hollywood—69
 Jacksonville—4+, 7,
 12+, 17, 30+, 47-, 59
 Key West—16+, 22+
 Lake City—41
 Lakeland—32
 Leesburg—45-, 55
 Madison—36-
 Marianna—16+
 Melbourne—43+, 56
 Miami—2, 4, 6, 7-, 10+,
 17-, 23-, 33, 39, 45+
 Naples—26-
 New Smyrna Beach—
 15+
 Ocala—29, 51-
 Orange Park—25-
 Orlando—6-, 9-, 24-,
 35+
 Palatka—42
 Panama City—7+, 13,
 22+, 28-
 Pensacola—3-, 23,
 33+, 44
 St Petersburg—10-, 38,
 44+
 Sarasota—40
 Sebring—*48
 Tallahassee—11-, 27+,
 40+
 Tampa—3, 8-, 13-, 16,
 28
 West Palm Beach—5,
 12, 29+, *42+, 61

Georgia

Albany—10, 19-, 31-
 Ashburn—23+
 Athens—*8-, 34
 Atlanta—2, 5-, 11+,
 17-, *30, 36, 46-,
 *57+, 69
 Augusta—6+, 12-, 26,
 54-
 Brunswick—21+
 Carnesville—52
 Carrollton—49-
 Cedartown—65-
 Chatsworth—18-
 Cochran—15
 Columbus—3, 9+, 28
 38+, 48, 54+
 Dawson—25
 Draketown—27-
 Elberton—*60+
 Flintstone—*51-
 Lafayette—*35
 Macon—13+, 24+, 41+,
 *47+
 Pelham—*14-
 Rome—14+
 Royston—*22+
 Savannah—3, *9-, 11,
 22, 28-
 Thomasville—6
 Toccoa—32-, *68-
 Valdosta—*33, 44-
 Vidalia—*18+
 Warm Springs—
 Waycross—*8+
 Wrens—*20-
 Young Harris—*50+

Hawaii

Hilo—2, *4, 9, 11, 13,
 14+, 20+, 26+, *32+,
 *38+
 Honolulu—2+, 4-, 9-,
 *11+, 13-, 14, 20, 26,
 32, *38, *44
 Lihue—3+, *8-, 10+,
 12-, 15-, *21-,
 *27-, *67

Wailuku—3, 7, *10, 12,
 15, 21, *27, *33

Idaho

Boise—2, *4+, 7, 14
 Burley—*17+
 Caldwell—9-
 Coeur D'Alene—*26+
 Grangeville—*15-
 Idaho Falls—3, 8+, 20,
 *33+
 Filer—*19-
 Lewiston—3-
 Moscow—*12-
 Nampa—6, 12+
 Preston—*28
 Pocatello—6-, *10, 15,
 25+, 31-
 Sandpoint—*16+
 Twin Falls—11, *13-
 Weiser—*17

Illinois

Aurora—60
 Bloomington—43
 Carbondale—*8
 Champaign—3+, 15-
 Chicago—2-, 5, 7, 9+,
 *11, *20, 26, 32, 38-,
 44
 Danville—68
 Decatur—17, 23-
 De Kalb—*33
 Edwardsville—*18-
 Elgin—66+
 Freeport—23, *65-
 Galesburg—63
 Harrisburg—3
 Jacksonville—*14
 Joliet—14-1, 66+
 Kankakee—*54-
 La Salle—35
 Macomb—*22+
 Marion—27
 Moline—8, *24-
 Mount Vernon—13
 Olney—*16-
 Peoria—19, 25+, 31+,
 47-, *59+
 Quincy—10-, 16+,
 *27+
 Rockford—13, 17-, 39
 Rock Island—4+
 Springfield—20+, 49-,
 55+, *65+
 Streator—*64+
 Urbana—*12-, 27-
 Vandalia—*21

Indiana

Anderson—67+
 Angola—63
 Bloomington—4, *30-,
 63+
 Elkhart—28+
 Evansville—7, *9+, 14-,
 25-, 44-
 Fort Wayne—15+, 21+,
 33-, 39-, 55
 Gary—*50, 56+
 Hammond—62+
 Indianapolis—6, 8-,
 13-, *20-, 40, 59-,
 *69
 Kokomo—29-
 Lafayette—18, 24
 Madison—60+
 Marion—23
 Muncie—49, 61-
 Richmond—43+
 South Bend—16, 22
 34-, 46
 Terre Haute—2+, 10,
 26- 38
 Vincennes—22-

Iowa

Ames—5, 23-, 34+
 Burlington—26-, *57-
 Carroll—18-
 Cedar Rapids—2, 9-,
 28+
 Centerville—*31-
 Council Bluffs—32
 Davenport—6+, 18+,
 30-, 36+
 Decrahan—14+
 Des Moines—8-, 11+,
 13-, 17+, 43-, 63-,
 69

Dubuque—16-, 29-,
 40-
 Estherville—49+
 Fort Dodge—*21, 50+
 Fort Madison—*38+
 High Point—*14-
 Iowa City—12+, 20-
 Keokuk—*44+
 Keosauqua—*54+
 Lansing—*41+
 Mason City—3+, 24+
 Mount Ayr—*25-
 Ottumwa—15+, 33-
 Red Oak—36
 Rock Rapids—*25+
 Sibley—*33
 Sioux City—4-, 9, 14,
 27-
 Spirit Lake—*38
 Waterloo—7+, 22-,
 32-

Kansas

Chanute—30+
 Colby—4
 Columbus—34+
 Dodge City—6-, *21-
 Emporia—25+
 Garden City—*9, 11+,
 13-
 Goodland—10
 Great Bend—2
 Hays—7-, *14
 Hutchinson—*8, 12,
 36+
 Lakin—*3
 Lincoln Center—*9,
 11+, 13-
 Manhattan—*21
 Oakley—*15-
 Parsons—*39
 Phillipsburg—*22-
 Pittsburg—7+
 Pratt—*32+
 Randall—*9-
 Salina—18+ 34-, 44
 Sedan—*28
 Topeka—*11, *3+, 27,
 43, 49
 Wichita—3-, 10-,
 *15+, 24-, 33, *42

Kentucky

Ashland—*25-, 61+
 Beattyville—65
 Bowling Green—13,
 40+, *53-
 Campbellsville—34
 Covington—*54+
 Danville—56
 Elizabethtown—*23+
 Florence—
 Hazard—*35+, 57-
 Hopkinsville—51
 Lexington—18+, 27-,
 36, 46, 62
 Louisville—3-, 11, *15,
 21-, 32-, 41+, *68+
 Madisonville—*35-
 Morehead—*38+
 Murray—*21+
 Owensboro—19-, 31-
 Owenton—*52+
 Paducah—6+, 29
 Pikesville—*22-, 51+
 Somerset—16, *29+

Louisiana

Alexandria—5, *25+,
 31+, 41+
 Baton Rouge—2, 9-,
 *27+, 33-
 De Ridder—*23-
 Houma—11
 Lafayette—*3+, 10, 15,
 *24
 Lake Charles—7, *18,
 29
 Monroe—8+, *13, 14-,
 39+
 Morgan City—*14+
 Natchitoches—*28-
 New Iberia—36-
 New Orleans—4+, 6,
 8-, *12, 20-, 26,
 *32+, 38+
 Shreveport—3-, 12,
 *24-, 33
 Tallulah—*19

Maine

Augusta—*10-
 Bangor—2-, 5+, 7-
 Calais—*13-
 Fort Kent—*46+
 Fryeburg—*18+
 Houlton—*25+
 Kittery—*34
 Lewiston—8-, 35-
 Millinocket—*44-
 Orono—*12-
 Portland—6-, 13+,
 26-, 51
 Presque Isle—8, *10+
 Rumford—*43+

Maryland

Annapolis—*22+
 Baltimore—2+, 11-,
 13+, 24+, 45, 54,
 *67-
 Cumberland—52+, 65
 Frederick—*62
 Hagerstown—25-, *31
 Oakland—*36+
 Salisbury—16+, *28-,
 47-
 Waldorf—*58+

Massachusetts

Boston—2+, 4-, 5-, 7+,
 25+, 38, *44+, 56
 68+
 Greenfield—32+
 New Bedford—6+, 28-,
 *47-
 North Adams—19, *35
 Pittsfield—51+
 Springfield—22, 40,
 *57+
 Worcester—141 27,
 *48+, 66

Michigan

Alpena—*5, 11
 Ann Arbor—31+, *58+
 Bad Axe—*15-+
 Battle Creek—41
 Bay City—5-, *19+
 61+
 Cadillac—9, *27
 Calumet—5-, *22-
 Cheboygan—44
 Detroit—2+, 4, 7-, 20+,
 50-, *56, 62
 East Lansing—*23-,
 *69-
 Escabana—3+
 Flint—12-, *28, 66-
 Grand Rapids—8+,
 13+, 17, *35+
 Iron Mountain—8-
 *17+
 Ironwood—*15-, 24+
 Jackson—18+
 Kalamazoo—3-, *52+
 64
 Lansing—6-, 47, 53-
 Manistee—*21
 Manistigon—*15+
 Marquette—6-, *13, 19
 Mount Clemens—38+
 Mount Pleasant—*14
 Muskegon—54+
 Parma—10-
 Petoskey—*23+
 Pontiac—22
 Port Huron—46+
 Saginaw—25-, 45-
 Sault Ste Marie—8, 10+,
 *32-
 Traverse City—7+, 29-
 West Branch—*24

Minnesota

Alexandria—7, 24
 Appleton—10-
 Austin—6-, 15-
 Bemidji—9, 26+
 Brainerd—22
 Crookston—33
 Duluth—3, 8, 10+, 21+,
 27-
 Ely—17-
 Fairmont—16+
 Hibbing—13-, 18-
 International Falls—11,
 35+

Mankato-12, 26-
Marshall-30-
Minneapolis-St. Paul-
2-, 4, 5-, 9+, 11-,
17, 23+, 29+
Rochester-10, 47-
St. Cloud-19, 25-, 41
St. James-32+
Thief River Falls-10
Wadena-20
Walker-12-
Willmar-14-
Winona-35+, 44-
Worthington-20

Mississippi

Biloxi-13+, 19+, 25-
Booneville-12-
Bude-17+
Clarksdale-21
Cleveland-31-
Columbia-45
Columbus-4-, 27, 43
Greenville-15-, 44
Greenwood-6+, 23+
Hattiesburg-22, 47
Houston-45+
Jackson-3, 12+, 18,
29+, 40
Laurel-7, 18+
Meridian-11-, 14,
24-, 30-
Miss. State-2+
Natchez-42+
Oxford-18
Senatobia-34-
Tupelo-9-
Vicksburg-35-
Yazoo City-32-

Missouri

Birchtree-20-
Bowling Green-35+
Cape Girardeau-12,
23, 39-
Carrollton-18
Columbia-8+, 17,
23+
Flat River-22
Hannibal-7-
Jefferson City-13, 25,
36-
Joplin-12+, 16, 22-
Kansas City-4, 5+, 9+,
19+, 41-, 50-, 62+,
68-
King City-28-
Kirksville-3-
La Plata-21+
Lowry City-15-
Poplar Bluff-15+, 26+
Rolla-28
Sikeston-45
St. Joseph-2-, 16-, 22
St. Louis-2, 4-, 5-, 9,
11-, 24+, 30+, 40-,
46
Sedalia-6
Springfield-3+, 10,
21-, 27-, 33-

Montana

Anaconda-
Billings-2, 8, 11, 14,
20+
Bozeman-7-, 9
Butte-2+, 4, 6+, 18,
24
Cut Bank-14-
Dillon-14+
Glendive-5+, 13+,
16-
Great Falls-3+, 5+, 16,
26, 32
Hardin-4+
Havre-9+, 11+, 18-
Helena-10+, 12, 15+
Joplin-48, 54-
Kalispell-9-, 29-
Lawson-13
Liberty-3-
Missoula-8-, 11-
Miles City-3-, 6, 10
Missoula-13-, 23-
Mott Point-17+
Mullan-17+

Nebraska

Abbeville-8+, 21+
Allamore-13-
Bassett-7-

Beatrice-23+
Falls City-24
Grand Island-11-,
17-
Hastings-5-, 29+
Hay Center-6
Hay Springs-Scot-
tshluff-4+
Kearney-13
Lexington-3+
Lincoln-10+, 12-, 45,
51
McCook-8-
Merriman-12
Norfolk-19+
North Platte-2-, 9+
Omaha-3, 6+, 7, 15,
26, 42+, 48-
Pawnee City-33+
Scottsbluff-10-
Superior-4+

Nevada

Boulder City-5+
Elko-10-, 14+
Ely-3-, 8-
Fallon-25
Goldfield-2-
Las Vegas-3, 8-, 10+,
13-, 21+
McGill-13
Reno-2, 4, 5, 8, 21+,
27+
Tonopah-9-, 17+
Winnemucca-7+,
15-
Yerington-16+

New Hampshire

Berlin-40-
Concord-21+
Durham-11
Hanover-15+, 31
Keene-52+
Littleton-49+
Manchester-9-, 50-,
60+
Portsmouth-17-1

New Jersey

Asbury Park-583
Atlantic City-181, 36,
53+
Burlington-48-
Camden-23+
Little Falls-50+
Newark-13-, 68
New Brunswick-
19-, 47+, 58
Paterson-41-
Trenton-52-
Vineland-65-
Wildwood-40

New Mexico

Alamogordo-18-
Albuquerque-4+, 5+,
7+, 13+, 14-, 23-,
32+
Carlsbad-6-, 15+,
25-
Clayton-17
Clovis-12-
Deming-16
Farmington-12+, 15+
Gallup-3, 8-, 10
Hatch-
Hobbs-29+
Las Cruces-22-, 48+
Lovington-19
Portales-3+
Raton-18-
Roswell-8, 10-, 21-,
27-, 33+
Santa Fe-2+, 9+, 11-,
19-
Silver City-6, 10+, 12
Socorro-15-
Tucumari-15

New York

Albany-Schenectady-
6, 10-, 13, 17+, 23-,
29+, 45
Amsterdam-39+, 55
Binghamton-12-, 34,
40-, 46+
Buffalo-2, 4-, 7+, 17,
23, 29-, 49-

Carthage-7-
Corning-30-
Elmira-18+, 36-
Glens Falls-58-
Ithaca-52, 65+
Jamestown-26+, 46
Kingston-63
Lake Placid-5-, 34+
Leviatown-21-
Massena-18
New York-2, 4, 5+, 7,
9+, 11+, 25, 31-
Oneonta-151, 42
Poughkeepsie-54+
Plattsburgh-57
Poughkeepsie-54+
Riverhead-55+
Rochester-8, 10+,
13-, 21, 31+, 61+
Syracuse-3-, 5-, 9-,
24+, 43+, 62+
Utica-2-, 20+, 33, 59
Watertown-16, 50+

North Carolina

Andrews-59
Asheville-13-, 21+,
33, 62+
Bryson City-67
Burlington-16
Canton-27
Chapel Hill-4+
Charlotte-3, 9+, 18, 36,
42+
Columbia-2
Concord-58
Durham-11+, 28+
Fayetteville-40+, 62
Franklin-56+
Goldsboro-17-
Greensboro-2-, 48-,
61
Greenville-9-, 14, 25
Hickory-14-
High Point-8-, 32+,
67+

Jacksonville-19
Kannapolis-64-
Laurel Hill-59+
Lexington-20
Linville-17
Lumberton-31
Morganton-23-
New Bern-12+
Raleigh-5, 22, 34-
Roanoke Rapids-38-
Rockingham-53
Rocky Mount-47+
Washington-7
Waynesville-59
Wilmington-3-, 6,
29+, 39-
Wilson-30-
Winston-Salem-12,
26+, 45

North Dakota

Bismarck-5, 12, 17,
26+
Devils Lake-8+, 22+
Dickinson-24-, 9-, 7
Ellendale-19-
 Fargo-6, 11+, 13, 15-
Grand Forks-2, 14+,
27+
Jamestown-7-, 23
Minot-6+, 10-, 13-,
14-, 24
Pembina-12
Valley City-4-
Williston-4, 8-, 11-,
15-

Ohio

Akron-23+, 49+, 55-
Alliance-45+
Ashtabula-151
Athens-20-
Bowling Green-27+
Cambridge-44-
Canton-17-, 67
Chillicothe-53
Cincinnati-5-, 9, 12,
19+, 48-, 64-
Cleveland-3, 5+, 8, 19,
25+, 61
Columbus-4-, 6+,
10+, 28-, 34, 56-
Dayton-2, 7+, 16+,
22+, 45

Defiance-65+
Hillsboro-24+
Lima-35-, 44+, 57+
Lorain-43
Mansfield-47+, 68!
Marion-
Newark-31-, 51
Oxford-14+
Portsmouth-30, 42-
Sandusky-52
Springfield-26+, 66
Staubenville-9+, 62+
Toledo-11-, 13, 24-,
30+, 36-
Youngstown-21-, 27,
33, 58
Zanesville-18-

Oklahoma

Ada-10+, 22
Altus-19-
Ardmore-12-, 171,
28-
Bartlesville-17+
Cheyenne-12+
Elk City-8+, 15-
Enid-20-, 26+
Eufaula-3
Geymon-16
Hugo-42+, 15+, 48+
Hugo-Paris (Tex.)-15+,
42+
Lawton-7+, 36-, 16-,
45
McAlester-32-
Miami-18-
Muskogee-19
Oklahoma City-4-, 5,
9-, 13+, 14-, 25-,
34-, 43+, 52
Tulsa-2+, 6+, 8-,
11-, 23, 35-,
41+, 47
Woodward-17-

Oregon

Astoria-21
Bend-15, 21+
Brookings-14-
Burns-18
Corvallis-7
Eugene-9+, 13, 16+,
28-
Grants Pass-18+
Klamath Falls-2-,
22+
La Grande-13+, 16
Medford-5, 8+, 10+,
12+
North Bend-11, 17+
Portland-2, 6+, 8-,
10, 12, 24+, 30, 40-
Roseburg-4+
Salem-3+, 22, 32
The Dalles-17-

Pennsylvania

Allentown-39, 69
Altoona-10-, 23-, 47,
57+
Bethlehem-60-
Clearfield-3+
Erie-12, 24, 35+, 54+,
66+
Greensburg-40+
Harrisburg-21+, 27-,
33+
Hazleton-56
Johnstown-6, 8!, 19+,
28+
Lancaster-8+, 15+
Lebanon-59-
Philadelphia-3, 6-, 10,
17-, 29, 35-, 57
Pittsburgh-2-, 4+, 11,
13-, 16, 22, 53+
Reading-51
Scranton-16-, 22-,
38+, 44-, 64
State College-29+,
55+
Wilkes-Barre-28
Williamsport-20-1
York-43, 49+

Rhode Island

Providence-10+, 12+,
161, 36, 64+

South Carolina

Aiken-44
Allendale-14
Anderson-40
Beaufort-18-
Charleston-2, 4, 5+,
7-
Columbia-10-, 19+,
25-, 35+, 57-
Conway-23+
Florence-13+, 15-, 21,
33+
Georgetown-41-
Greenville-4-, 16+, 29
Greenwood-38
Myrtle Beach-43+
Rock Hill-30+, 55-
Spartanburg-7+, 49
Sumter-27-

South Dakota

Aberdeen-9-, 16-
Allen-22+
Brookings-8
Eagle Butte-13
Huron-12+
Lead-5-, 11+
Lowry-11-, 56, 62+,
68-
Martin-6-
Mitchell-5+
Pierre-4, 10+
Rapid City-3+, 7+, 9,
15-, 21-
Reliance-6-
Seneca-2-
Sioux Falls-11, 13+,
17-, 23, 36+
Vermillion-2-
Watertown-3+

Tennessee

Athens-24
Chattanooga-3+, 9,
12+, 45, 61-
Cookeville-22, 28+
Crossville-20+, 55+
Fayetteville-52-
Greenville-39-
Jackson-7+, 16+, 32+
Johnson City-11-, 41
Kingsport-19
Knoxville-6, 8, 10+,
15-, 26-, 43+
Lexington-11
Memphis-3-, 5+, 10+,
13+, 14+, 24, 30
Murfreesboro-39+
Nashville-2-, 4+, 5,
8+, 17+, 30+, 42
Sneedville-2+

Texas

Abilene-9+, 15, 26+,
32+
Alpine-12-
Amarillo-2-, 4, 7, 10,
14+
Austin-7+, 18+, 24, 36,
42-
Bay City-43+
Beaumont-8-, 12, 21,
34-
Big Spring-4-, 14
Boquillas-8-
Brady-13
Brownsville-23
Bryan-3, 15
Childress-21
Corpus Christi-3-, 6,
10-, 16, 28-, 38+
Dallas-4+, 8, 13+,
27-, 33+, 39
Del Rio-10, 24+
Denton-2
El Paso-4, 7, 9, 13, 14,
26+, 38-
Fort Stockton-5+
Fort Worth-5+, 11-,
21-, 31+
Galveston-22, 48
Harlingen-4+, 44, 60
Houston-2-, 8, 11+,
13-, 14, 20, 28, 39-
Irving-19

TV Assignments, TV Transfers

Laredo—8, 13, 27-, 39
Longview—*161, *51-
Lubbock—5-, 11, 13-,
28, 34-
Lufkin—9
McAllen—48
Marfa—3
Marshall—22-, 35+
Midland—2+, 18
Monahans—
Monahans-Odessa—9-
Nacogdoches—19-, 32
Odessa—7-, 24-, 30,
36+
Paris-Hugo (Okla.)—
42+
Port Arthur—4-
Presidio—7+
Richardson—23
Rosenburg—45
San Angelo—3-, 6, 8+,
*21+
San Antonio—4, 5, 9-,
12+, 23-, 29+, 41+
Sherman—20-, 26-
Sonora—11+
Sweetwater—12
Temple—6+, 46-
Texarkana—6, 17-, *34
Tyler—7, 14+, 38
Victoria—19+, 25, 31
Waco—10+, 25+, 34+,
44-

Weslaco—5-
Wichita Falls—*3+, 6-,
18-, *24

Utah

Cedar City—4, 16+
Logan—12-, 22
Moab—14+
Monticello—16-
Ogden—9+, 18-, 24, 30
Price—3+, *15
Provo—11+, 16
Richfield—8+, 19
Salt Lake City—2-, 4-,
5+, *7-, 13+, 141,
20+, *26-
St. George—18-
Vernal—6, *17+

Vermont

Burlington—3, 22+, 33-
Rutland—28+
St. Johnsbury—20-
Windsor—41

Virginia

Blacksburg—43
Bluefield—63+
Bristol—5+, 28-
Charlottesville—29-,
41-, 64+
Courtland—52
Danville—24-, 44+, 56

Fairfax—*56-
Farmville—*31-
Fredericksburg—53,
69+
Front Royal—42
Hampton—13-, 15
Harrisonburg—3-
Kenbridge—
Lynchburg—13, 21-
*54+
Manassas—66+
Norfolk-Portsmouth-
Price—3+, *15
Newport News—3+,
10+, 27, 33, 49-,
*55+
Norton—*47-
Onancock—*25+
Petersburg—8
Richmond—6+, 12-,
*23, 35-, *57-, 63
Roanoke—7-, 10, *15+,
27+
Staunton—*51-
West Point—*46

Washington

Anacortes—24
Bellingham—12+, *34,
64
Centralia—*15+
Everett—16-
Kennewick—42+
Pasco—19-
Pullman—*10-
Richland—25, *31
Seattle—4, 5+, 7, *9,
22+, *28+

Spokane—2-, 4-, 6-,
*7+, 22, 28-
Tacoma—11+, 13-, 20,
*56, *62
Vancouver—*14, 49
Walla Walla—14-
Wenatchee—*18+, 27
Yakima—23+, 29+, 35,
*47

West Virginia

Beckley—4
Bluefield—6-, 40-
Charleston—8+, 11+,
23, 29, *49-
Clarksburg—12+, 46-
Fairmont—66+
Grandview—*9-
Huntington—3+, 13+,
*33+
Keyser—*48+
Martinsburg—*44
Morgantown—*24-
Parkersburg—15-, 39+,
*57
Weirton—*50+
Weston—5
Wheeling—7, 141, *41
Williamson—*31+

Wisconsin

Appleton—32+
Bloomington—*49
Colfax—*28-
Eau Claire—13+, 18
Fond du Lac—34+

Green Bay—2+, 5+,
11+, 26+, *38
Highland—*51
Janesville—57+
Kenosha—55-
Kieler—*46+
La Crosse—8+, 19+, 25,
*31
Madison—3, 15, *21-,
27+, 47+
Manitowoc—16+
Milwaukee—4-, 6,
*10+, 12, 18-, 24+,
30, *36
Oshkosh—22+
Park Falls—*36+
Racine—49+
Rhineland—12+
Sheboygan—28
Superior—6+, 40
Suring—14-
Tomah—43
Wausau—7-, 9, *20+,
33-

Wyoming

Casper—2+, *6+, 14-,
20-
Cheyenne—5+, *17,
27-, 33-
Lander—4
Laramie—*8+
Rawlins—11-
Riverton—10+
Rock Springs—13
Sheridan—7, 12+

U.S. Territories and Possessions

Guam

Agana—*4, 8, 10, *12

Puerto Rico

Aguadilla—*32, 44
Arecibo-Aguadilla—12+
Arecibo—54, 80
Bayamon—36
Caguas—11-, *58
Carolina—52
Cayey—76
Fajardo—13+, *40
Guayama—46
Humacao—68
Mayaguez—*3+, 5-, 16,
22
Ponce—7+, 9-, 14, 26,
*26, 48
San Juan—2+, 4-, *6+
18, 24, 30, *74
San Sebastian—38
Utua—*70
Vega Baja—64
Yauco—42

Virgin Islands

Charlotte Amalie—10-
17, *23, 43
Christiansted—8+, 15,
*21, 27
Charlotte Amalie-Christ-
iansted—*35, *12

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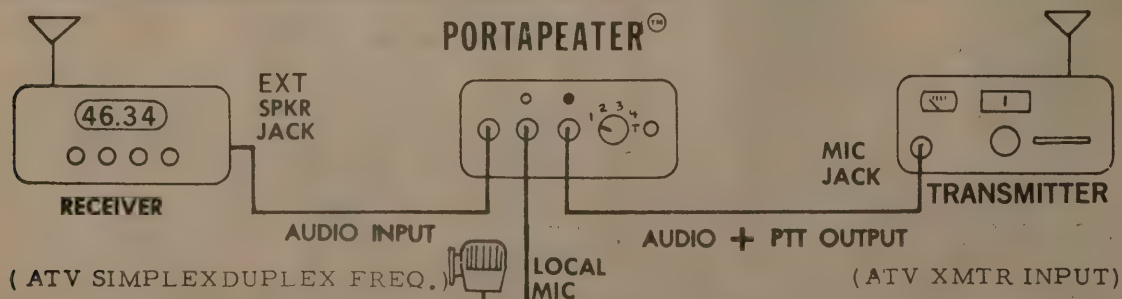
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Ease of mounting the PCB in the 100A is made possible by the use of a .156" 22 pin edge card connector layout.



432 MHZ SSB REPORT

by Ed Fitch, W0OHO

Many of you Amateur Television UHF-TV enthusiasts are experiencing the same joys and woes as we 432 Mhz. SSB'ers do. We are all striving for the best sensitivity via UHF preamps, the lowest "loss" via hard to comeby hardline or heliax cable and we both monitor UHF band propagation to take advantage of "up conditions". Mike Stone of A5 Magazine has asked me to let A5 readers know what is happening in the 432 Mhz. SSB "world" once in awhile and I would be glad to do so. I publish a newsletter called "432 News" designed to report and provide information on UHF-SSB activity not involving EME. (There is a separate EME Newsletter on the east coast.)

It is not surprising to note that many ATV'ers also run 432 Mhz. SSB in addition to the video TV mode. Midwest FSTV'ers utilize "on-carrier" audio modulation either within the TV transmitter or on a separate system. Utilizing 432 Mhz. SSB offers an additional challenge in UHF communications using the "same" antenna system already erected for ATV. For those of you interested in getting on 432 Mhz. SSB, drop me a line and I will give you all the help I can and how to get on the regular newsletter mailing listing. (Don't forget Amateur Satellites are workable on SSB in the same area too!)

Spring 432 Mhz. SSB Updates (Condensed)

April and May Activity; Aurora report by W0MDL/K9UIF on 4/11, lots of reports of wind damage, W8UT moved to INDIANA from WV, WA0FLS moved from Iowa to Denver, some of you may have noticed W0OHU absent since 4/21, yours truly lost power output on my Icom 451-back and forth to the factory a couple times and we are back on-the-air again. It should be noted that my warranty ran out by 20 days but Icom took care of all expenses except for the shipping! VE4MA has received tentative approval to install some beacons at US/VE4 border (south of Winnipeg near I-29) and plans to have it at 25W out on 144.025 with an additional output at 432.075 Mhz. (10W) by early July. More information to come. Henry Radio has a "new" amplifier for 432 (Tempo 2004) with 2000 watts input at 440 Mhz. for \$1095. See inside cover of June 82 QST. W9UD operated from the SE tip of MN. during the June 12-14th ARRL VHF Contest. We will try something new this year moving our antennas in degrees with the minute hand of the clock from 15 minutes past to 45 minutes past (East to West) at one minute intervals looking for contacts (Sunday only). Operating frequencies are 144.193, 220.103 and 432.093 Mhz. A "nationwide" calling frequency on 1296 Mhz. has been established at 1296.100 Mhz. Those still working 1296.000 should go up to .100 immediately. January 82 results (432) VHF Contest; K2RIW 18,744-142-23, W3OZ 4,968-54-13, K1CM 2,108-31-7, AJ6T 2,040-34-5, W3MSN 672-14-2, W0OHU 660 11-5, G3BVU/W1 616-11-4, W5UKQ 616-11-4. Feedback on last month's question on antenna mounted preamps by W8UT; Walt, AJ6T uses an ARR P432VD with 2 SPDT relays (one Dowkey/UHF fittings and one Transco/N type) and a control box which disables his rig until the auxillary contacts on the relay close. For complete newsletters and DX Schedule information, write; Ed Fitch - W0OHU, 1628 Northern Heights Drive, Rochester, MN. 55901 (SASE required). For 432 Mhz. EME information, contact Al K2UYH. TNX W0OHU



TVRO "SHAM" IN IOWA UNCOVERED

A5 SUBSCRIBER PLEAS FOR HELP FROM GOVERNMENT AGENCIES

Shown below is a letter to A5 ATV Magazine pleading for investigation information and help in a long-time battle concerning John Rohner and Associates of West Liberty, Iowa and Clyde A. Miller WB4AOH of Owensboro, Kentucky. After several meetings with Mr. Miller, A5 Magazine decided to visit the Rohner facility and "take a look for ourselves. After months of interviews and investigation, we publish our findings and comments;

APR 10 1982

CLYDE A. MILLER, D.C., PH. C.
1701 FREDERICK STREET
OWENSBORO, KENTUCKY 40301



March 3, 1982

Mr. Mike Stone
A5 Amateur Television Magazine
Louden, Iowa 52255

Dear Mr. Stone:

I have been enjoying A5 Magazine for some time now and I especially enjoyed your latest article on TVRO. You have a very fine reputation with SSTV hams.

I have been told that you might be able to help me with a TVRO problem. This is a serious problem that I have been working on since early last summer and I have not been able to resolve.

Early last spring I decided to get into Satellite TV, so I sent inquiries to a number of manufacturers. I received information from a company called Rohner & Associates, West Liberty, Iowa. Their literature stated that their receiver was as good as anything on the market and the price was \$750.00 which was very competitive with other receivers on the market. I called Rohner & Associates and talked with a John Rohner and he claimed that his system was one of the best available.

Since I wanted the equipment as soon as possible, we made an oral agreement that on a specified date I would drive from Owensboro, Kentucky, to West Liberty, Iowa, (approximately 1,000 miles round trip) to pick it up. Mr. Rohner agreed to have the receiver ready at that time.

When I arrived in West Liberty, Iowa, I could hardly believe what I saw at the address I was given. (Refer to the enclosed photo.) The old delapidated buggy shed you see is the headquarters for Rohner & Associates, Inc.

After meeting Mr. Rohner, he seemed very well informed as to TVRO, so I over-looked the unbusinesslike appearance of the place.

Mr. Rohner told me he did not have a receiver ready but if I could wait he would put one together for me. About seven hours later I paid him and was on my way home with a receiver and an 8' spherical antenna kit that he said would work as well as a 10' parabolic.

Mr. Mike Stone
March 3, 1982
Page 3

On the following Sunday's TVRO Users Net I confronted Mr. Rohner about my problem and asked him if I could telephone him without getting the telephone answering machine. He said he would answer the phone. When I phoned, he called me every cuss word he could think of for giving the impression on the net that I was having problems with his equipment. After he finished cursing me out, he said to send the receiver I had back and he would refund my money on both units.

I sent the receiver back to him collect via U.P.S. on October 27, 1981, because I felt I could no longer trust him. Several days later I received the package back from U.P.S., marked "No Money." I now have this nonworking receiver and he still has the other receiver that was returned to him in September (almost six months ago).

I gave up on ever getting a working TVRO Receiver from Rohner & Associates so I purchased Automation Techniques systems and am getting perfect pictures.

I have written to the Postal Inspector, Iowa Better Business Bureau, Iowa, Consumer Protection Division of the Attorney General's Office, The Kentucky Attorney General's Office and the F.C.C. (find copies of these letters enclosed.) The only replies I have received from these offices state that Rohner & Associates has not answered their letters of inquiry.

Mr. Rohner is on the Satellite Users Net almost every weekend selling boards for his receivers and subscriptions to a magazine he is producing. As you know, the use of Amateur Radio for business or personal gain is against F.C.C. Rules and Regulations.

I would like to send the one Rohner & Associates TVRO Receiver that I do have to you for inspection. You may want to do a product report on it in a future A5 Magazine. As I stated above, I do not have the second receiver which I purchased and paid for as it has never been returned to me.

I see from the map that you are not very far from Rohner & Associates, so if there is anything you can do to help me with this problem, it would be greatly appreciated. Please feel free to call me collect if you need more details concerning this matter.

Sincerely,

Clyde A. Miller

Clyde A. Miller, WB4AOH

CAM/LS

Mr. Mike Stone
March 3, 1982
Page 2

I built the antenna and hooked up the electronics but barely got a picture. I made a number of inquiries to TVRO dealers and they all said I would have to have a bigger antenna. So, I purchased a 10' parabolic fiberglass antenna and hooked the electronics to it. It produced a somewhat better picture but it had a tremendous amount of noise and distortion and was completely unusable. I then took the electronics to a TVRO dealer and hooked it up to his working system and got the same bad results.

On July 10, 1981, I sent the receiver back to Rohner & Associates with a letter describing its problems. After a month had passed and it had not been returned, I started telephoning to see why I hadn't received the repaired receiver. I could only reach the telephone answering machine with a message to leave my name and number for a return call. Miss calls were made this way over a period of two weeks; but, my calls were never returned. Several other persons called me were then placed to Mr. Rohner through the operator who finally did get him. He promised the receiver would be sent to me the following week.

After not receiving the TVRO receiver as promised, I decided to go get it myself. So, after another round of phone calls I was able to talk with Mr. Rohner who assured me it would be ready when I arrived. At this time, I ordered a second receiver from him because of a news letter published by Mr. Rohner stating that the Rohner receiver was performing as well or better than most receivers on the market. I asked him to have this second receiver ready for me at the same time I picked up the repaired unit.

When I arrived the morning of August 21st, he did not have the receiver repaired and the second receiver I had ordered was not ready to be picked up. So, again, I waited all day for him to build two new receivers and paid him for the second receiver before leaving on the return trip home.

When I arrived home and hooked up the receivers neither one would produce a watchable picture.

This time I returned both receivers to Rohner & Associates in September via the Post Office along with a letter stating that both receivers had image problems and were very noisy. I requested that they get them working this time or refund my money. THEY DID NEITHER.

After a few weeks passed and more phone calls had been made with promises of delivery, I heard Mr. Rohner on the 20 meter TVRO Users Net. I got on the air and asked him when I could expect my items. He said the following Friday, another week passed without getting the repaired TVRO receivers. I checked into the TVRO Users Net again the next Sunday and asked him when I could expect my shipment. He said that the receivers were being shipped from a dealer in Fulton, Kentucky, and that I would have THEM by Thursday.

On Friday, I received ONE receiver STRAIGHT FROM WEST LIBERTY, IOWA. It is a TVRO receiver in a "bickie-mouse" make-shift cabinet that does not even go together at the corners. There are bare sheet metal screws sticking out the bottom without feet or any protection to keep them from scratching whatever it sets upon. The power cord is stuck through a 5/8" hole without any type of strain relief or grommet. This channel, constructed receiver would not work either.

enclosed.

1. letter to John Rohner dated 9-21-81 stating receiver problems and notice of return.
2. US Postal Service form 0-13 routing-slip showing shipment and insurance of 2 Rohner receivers
3. Copy of Rohner and Associates Ad.
4. Copy of April/May 81 Rohner Newsletter stating how well his receiver's work.
5. United Parcel Services (UPS) receipt dated 7-10-81
6. Rohner receipts for two receivers and antenna dated August 21-81
7. 11-23-81 copy of letter from my postal inspector to Rohner advising possible lawsuit against him.
8. Copy of 11-30-81 letter to US Postal Inspector, Louisville, Kentucky concerning mail-fraud.
9. Copy of letter to FCC, Washington, D.C. concerning illegal use of Amateur Radio by John Rohner on 14,310 MHz. Satellite Users Net.
10. 12-15-81 copy of consumer complaint letter (file case #4082) against Rohner by Kentucky Attorney General's Office.
11. 12-16-81 return letter from FCC, Washington, DC, notifying investigation of the matter.
12. 12-18-81 Complaint Letter to Iowa Better Business Bureau, Des Moines, Iowa.
13. Return letter from Iowa Better Business Bureau, Des Moines, Iowa advising that the Iowa Attorney General's Office ~~is~~ is handling Rohner's complaint cases.
14. Copy of 12-18-81 Complaint Letter against Rohner to Iowa Attorney General's Office.
15. Copy of 12-19-81 Complaint forms filed against Rohner to Kentucky Consumer Complaint Division office.
16. UPS receipt for 2-Rohner receiver's returned COD to West Liberty, Iowa.
17. Copies of returned UPS "No Money COD's" refusal by Rohner Associates.
18. 1-22-82 2nd return letter to Rohner Associates by Kentucky Attorney General's Office (case #4,082)
19. Copy of 3-15-82 letter to Hunter Satellite Systems, Muscatine, Iowa asking for plaintiff information against Rohner Associates



A5 ATV MAGAZINE INVESTIGATES WB4AOH CLAIMS

The Saga Continues

After reading about this terrible situation, I did some investigating on my own and began to check with other known "Rohner Associate" equipment owners. Faulty equipment began popping up with several of the people I talked too. One "dealer" in Muscatine, Iowa apparently had so many problems with the West Liberty firm, that they have now dropped the sales of Rohner equipment and taken on a whole new line of TVRO equipment. They are selling out remaining units at below "cost" just to get rid of them, said an employee of the Muscatine firm. Another "dealer" reported problems with the systems initially, but that John Rohner had always "fixed" them at no charge-many times due to the fault of the customer. I phoned Clyde Miller one evening to sadly inform him of a declared bankruptcy by Rohner Associates of West Liberty, Iowa and that he was most likely "untouchable by any legal recourse. I asked Clyde to send me the remaining receiver so that I could witness the claimed "shotty-workmanship" for myself. The unit arrived via UPS a few days later and Clyde's description of the unit was more than accurate. Cold solder joints, broken connections, "rat's nest wiring," improperly terminated fittings, dangerous AC line cord hookup, poor transformer mounting, badly machined cabinet casing & screws that wouldn't even align up to put the case back together! All this for a suggested \$995.00 retail? I contacted Clyde Miller once again and asked him to come out this way sometime in the near future and we would go down to Rohner Associates in West Liberty, Iowa to meet the problem "head-on."

THE CONFRONTATION

Feeling like Mike Wallace of 60 minutes, Clyde and I drove down to Rohner Associates in West Liberty, Iowa. As we got directions in town, we came upon an impressive modern brick building with "Rohners" name on it that was a large production plant with many employees working inside. We quickly found out that this establishment was John Rohner's "brother's" plant-nothing to do with the TVRO systems. A little further down the same street stood John Rohner's "Plant". Clyde's description of a "garage-type shanty" was accurate once again (see photo). I thought to myself; "who are we to judge the looks of a "ham-shack"? After all, many great ideas and work comes from the worst looking shacks!" It was apparent as we entered John Rohner's establishment, that Clyde was not a welcome visitor. John Rohner's face was full of amazement as Clyde introduced me from A5 ATV Magazine. The problem was discussed and argued back and forth. It was established that Rohner had "sold" one of Clyde's receivers earlier (sent back for repair by Clyde) and that the "other" unit was over in the corner waiting to be fixed (along with a dozen or so other units that I could see). An "agreement" was reached that John Rohner would supply Clyde with two "new" units (with new design receiver boards) at no charge including a demonstration to A5 ATV Magazine that they were in perfect working order. The "units" would be ready by two weeks on a Friday for inspection. I was to pick them up and then mail them back down to Clyde in Kentucky.

FIBS TO A5 ATV MAGAZINE

I returned, as agreed, two-weeks later only to have John Rohner inform me that neither of the two units were finished yet. Mr. Rohner "promised" once again to bring the units personally to me in Lowden, Iowa on the following Tuesday in the morning around 10 a.m. Being only 30 miles or so from West Liberty, I went over directions with Mr. Rohner just so that he couldn't claim that he got lost on Tuesday.

HE DID IT TO US AGAIN

Yep, you guessed it, no-show on the following Tuesday morning. I waited until 12:30 p.m. until the phone rang and the caller was Clyde wanting to know how the big get-together turned out? "It didn't", I told Clyde. Clyde informed me that he had figured as much would happen and flew once again up to Iowa and would be over at Lowden in an hour or so to pick me up and we would go down again to West Liberty. As we pulled up to John Rohner's business, there he was outside with usual cigar-in-mouth "pouring" concret. "We missed you this morning," I told John Rohner. "We've been trying to get ahold of all morning, Mike-but you must not have been around your phone?" "Bull-----," said QCD! We all went back into the "magical palace" where "piracy of the airwaves domains." John was finishing the second receiver of Clyde's (the first one was apparently already done and sealed up in a box). I questioned John Rohner about the first unit and he said that it works just fine. John Rohner demonstrated the second unit on a live satellite TV picture. I mentioned that it seemed to have a lot of "snow" on it and the color was not real good. "We just had a lot of wind here the other day", said Rohner," and it probably moved my dish a little. Besides, I have purposely installed over 200 feet of RG cable for db loss insertion to check out my preamps. (Clyde and I had stepped off that claimed 200 feet one visit earlier which turned out to be about 45 feet.)

MORE QUESTIONS POP UP?

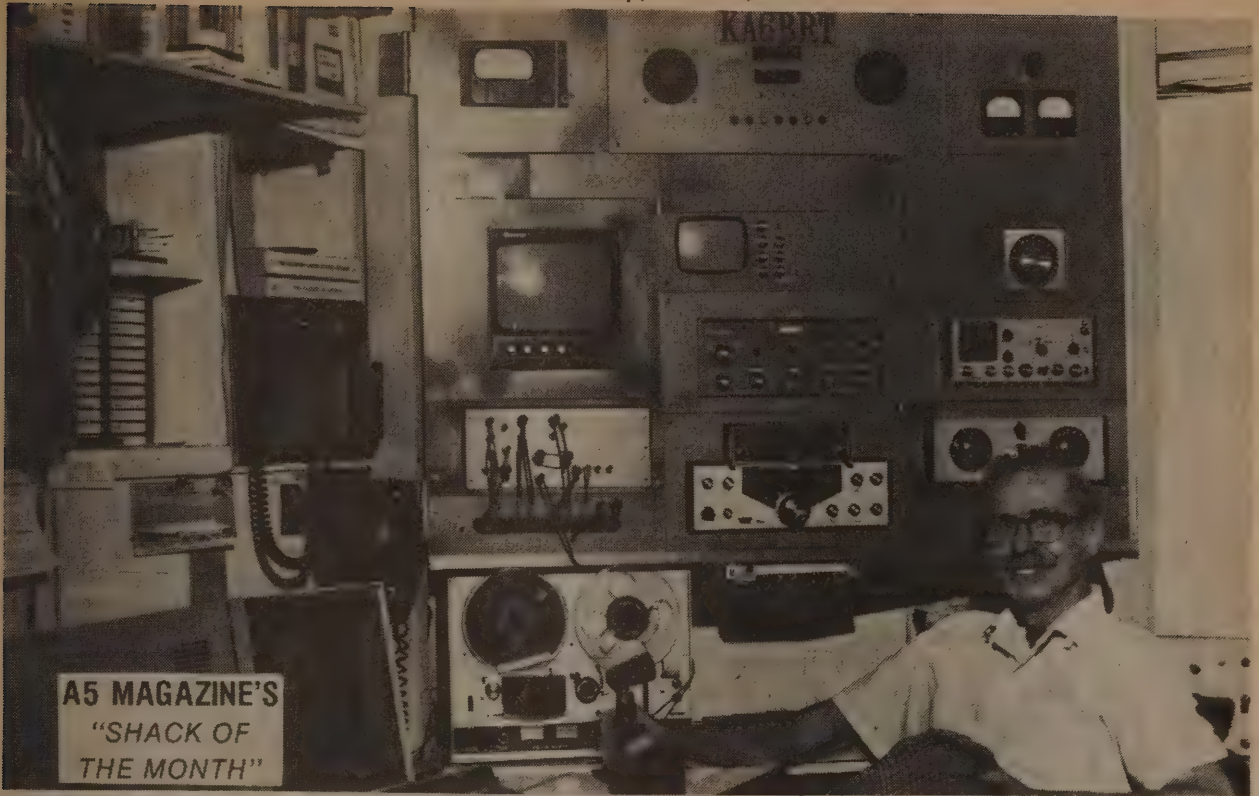
If you are a follower from the beginning of COOP'S SATELLITE DIGEST, you are well aware of the "mudslinging" back and forth by both TVRO hobby enthusiasts at each other. Similar stories of fraud and misrepresentation appear in some of COOP'S back issues. Even more information appears on Rohner and the EIA in the June 82 issue. Which side is to be believed is not the question here, but rather to what degree John Rohner is playing in misleading fellow Amateurs. Even his own ham-radio callsign WA6 has been questioned by many as far as legality. In older callbooks, the callsign belongs to a "novice class" license holder under a completely different name. Newer callbooks do not even list it. Our investigation revealed a statement by Rohner to one of his own customers that he never obtained an Amateur Radio license. Yet, there he is every Sunday on the 14.310 Mhz. Satellite Users Net answering TVRO questions and "promoting" his hardware right over-the-air! Hopefully, the FCC will eventually settle the license question.

THE STORY NEARS TO AN END

Clyde Miller finally got his two receiver's back (with new receiver boards supplied by Rohner) but reports "snowy" pictures and poor color strength levels from Kentucky while other tested systems including Clyde's new "Drake" system tested out perfectly. Unfortunately, the time and money Clyde has spent is long gone and unrecoverable. It is thru Clyde's efforts that his persistence to legally "rid" the world of Rohner type operators is recognized and admired. A "followup" letter by the Department of Justice-Attorney General's Office (Thomas J. Miller) of Iowa dated June 7th, 1982 revealed that "IT IS THE OUR OPINION THAT ROHNER AND ASSOCIATES HAS VIOLATED THE ABOVE NAMED LAW (Iowa Consumer Fraud Act 714 16 Code) AND WE ANTICIPATE FILING A CIVIL ACTION AGAINST HIM FOR SAID VIOLATION."

A5 MAGAZINE SUMMARY

John Rohner is a very likeable and obviously intelligent person. Some say that he might be even a bit "genius" on his TVRO designs. It is his business practice that leaves a lot to be desired. His official "bankruptcy" appears to be only a way to get of paying some long owed bills and possibly avoiding legal suits. His "quality control" suffers from irregular attainment surplus parts and a continuing changeover of workers. Final inspection of finished products by Rohner himself apparently isn't always done. His constant attacks on Bob Cooper and the rest of the industry makes one wonder if perhaps he shouldn't clean his own house first?



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SEPT. 18 & 19

EDITOR: Response on this series of articles has been so great we asked GERARD to "Keep Them Coming." (More TVRO articles will follow No. 7 in September.)



"ALL ABOARD TVRO"

5th of a 7 part series
Power Supply & Control

By Gerard Wilson, WA6RDA
PO Box 241
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Although there are many commercial low noise amplifiers available, nothing is more rewarding than the personal satisfaction of watching your home-brew TVRO receiver powered by your home-brew LNA. Simple steps are laid out here, and with careful attention, along with good construction practices, this LNA should save you a bundle of dollars. I do not intend to go into great detail on this subject, but I will highlight the "tip of the iceberg" so you may be able to get on with the show. I'm sure there will be a lot of unanswered questions, so please send self-stamped addressed envelope to me (p.o. Box 241 Glen Ellen Ca. 95442), and I will answer same day if possible.

First lets discuss what is all about. Basically you need about 40db of gain from 3.7 to 4.2 Ghz. You also need a noise figure as low as possible (between .9 to 1.2 db). Anything less than these ratings will degrade your system. A GasFet transistor on the first and second stage will ensure the low noise figure. Gain can then be achieved by bi-polar devices which cost less, and increase the gain to the required amount. Keep in mind that the larger the antenna is, the samller the requirement for the LNA. So if by luck you should acquire a 20' dish, you might well get by with only 20db of LNA gain. Your GasFet transistors cannot be merely hooked up to a supply. They must be "ramped" up to voltage in the correct manner, or you may destroy them. This is done by the simple IM324 bias supply, which provides the constant current and voltage you will need to power the GasFets.

The 4 items that are required to complete this project are:

1. feedhorn. Many feeds could be discussed, but they must be designed to the focal depth of the antenna you intend to use. Constructing a horn could be accomplished out of galvanized tin or similar material, refer to a microwave handbook that will lay out the correct dimentionions for your antenna. I recommend that you buy a **circular feed** such as the Chapperal feed. I have seen similar units advertised for as low as \$29, and they offer superior performance over a square or rectangular horn.

2. Waveguide to coax adaptor. This is a simple cavity that connects the horn to the LNA. A probe $\frac{1}{4}$ wavelength long is inserted into the cavity, and is coupled into the LNA.

3. GasFet amplifier module. This amplifies the very weak signal to a useable level.

4. Bias supply. This is necessary to provide the correct voltages and currents to the GasFet devices. First the Bias supply. When the 15 volt power supply is turned on, the integrator ramps on which allows VDS and BGS voltages to also ramp on. The drain source voltage (VDS) is a constant voltage, which is adjusted by the variable resistor R1. The constant drain current is maintained by the comparator and is adjusted by the 500 ohm pot for each stage. VDS is adjustable by R1 from 2.8 to 3.2 volts and should be set to about 3.0 volts nominal.

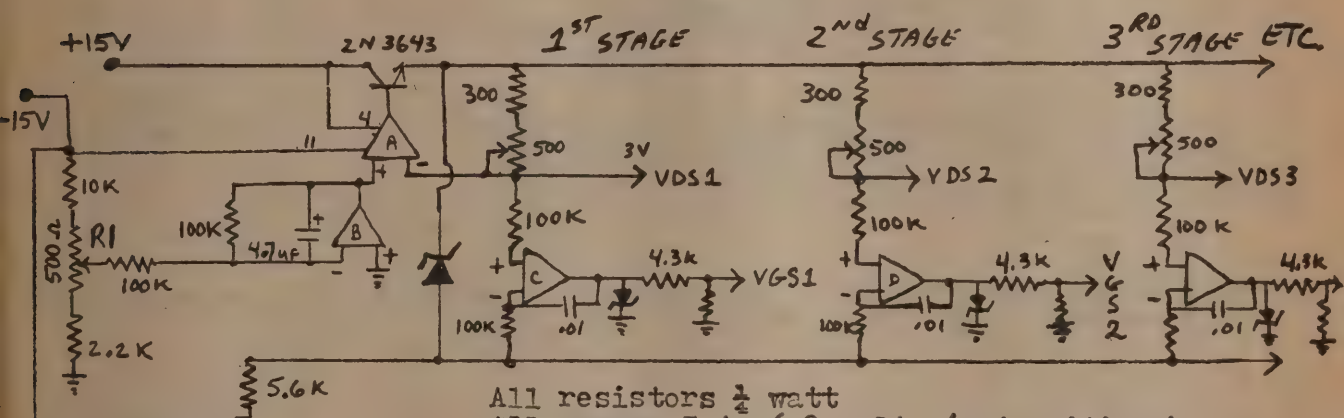
(The best Feedhorn I recommend, is found in a Homebrew Article in Ham Radio Magazine, May 1982. This is a circular feed that will eliminate the need for the wave-guide adaptor. Reprints of this article can be obtained from me for \$1.00 (Covers postage and handling costs.)

The current is adjustable from 8 to 20 ma., set by the 500 ohm resistor adjustment. The first stage should be set to about 10 ma for best noise figure, the rest can be turned up for maximum gain. I built my bias circuit capable to drive four GasFets, although it could be simplified to handle two insted. This would allow a bi-polar section to be substituted in the latter half. Construction can be laid out on perf-board, since it only has two IC's, but a simple etched board is available for \$9 if you don't feel up to breadboarding.

Diagram shown is for a 3 stage GasFet unit, and other stages can be added or subtracted as necessary. Note that GasFet transistors must be installed into circuit in order for it to work. I tried to measure voltages without the transistors in the circuit, and nothing seemed to work. The LM324 got very hot until I connected the GasFet, which set the appropriate gain and current combination. You will need a dual 15 volt power supply capable of several hundred MA for best stability. Other OP amps other than 324 can be used, such as the 747. The 324 is a quad device which makes it more compact. The zeners offer cheap insurance against over voltage damage to the GasFets, should something go astray.

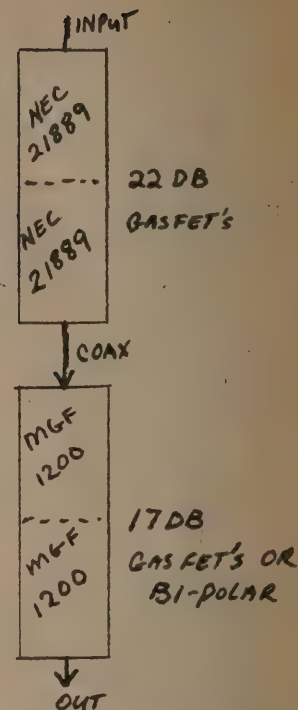
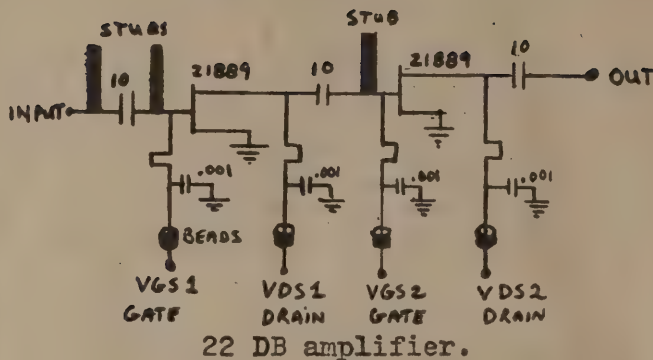
GASFET AMP When working with sensitive devices such as these, a grounded work area is necessary. Ground your wrist to a piece of metal or copper clad with a buss wire. Ground the soldering iron (20 to 30 watts) tip with buss wire also to the work surface. Use only just enough solder to make it stick.

This circuit layout was designed for the NEC 21889 GasFet, although it sure did work good with the Mitsubishi MGF 1412 and the MGF1200 directly substituted. I recommend using 2 NEC21889's followed by 2 MGF1200's or bi-polars. MGF1200's are inexpensive GasFets that sell for about \$13 each, and offer about 8db gain each. The noise figure is not good enough to be used in the front end. The NEC 21889's sell for about \$48 and are available from California Eastern Labs 3005 Democracy Way, Santa Clara Calif. 95050.



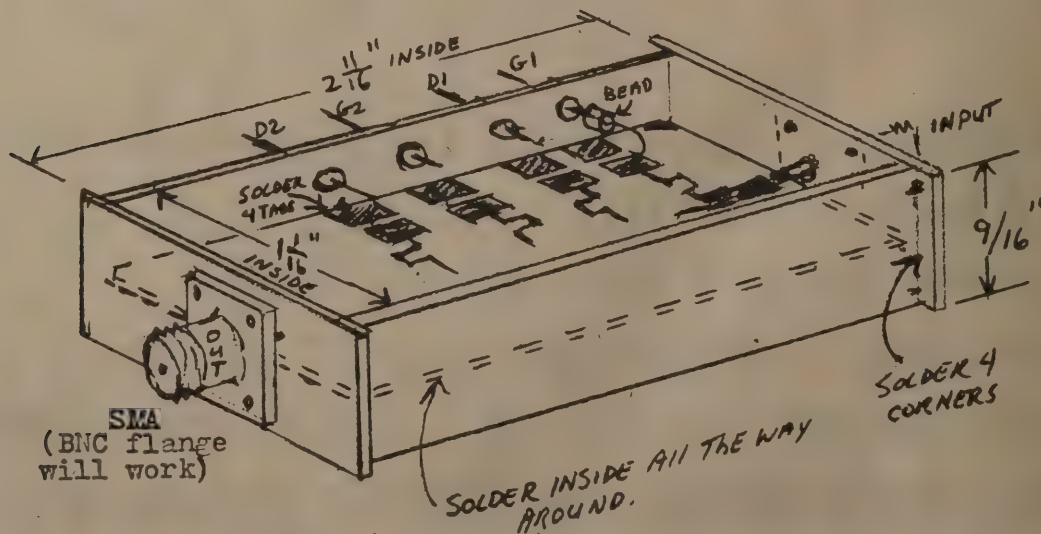
All resistors $\frac{1}{4}$ watt
All zeners 5 to 6.8 volt. (not critical)
LM324 OP AMP

Response has been so great on this WA6RDA "TVRO" Series, that we have asked Gerard to "Keep Them Coming!" After our Part 7 in the September Issue, WA6RDA will have a regular column on TVRO Satellite in A5 Magazine. If you "A5 Readers" have any TVRO projects, pictures or articles - send them to us!

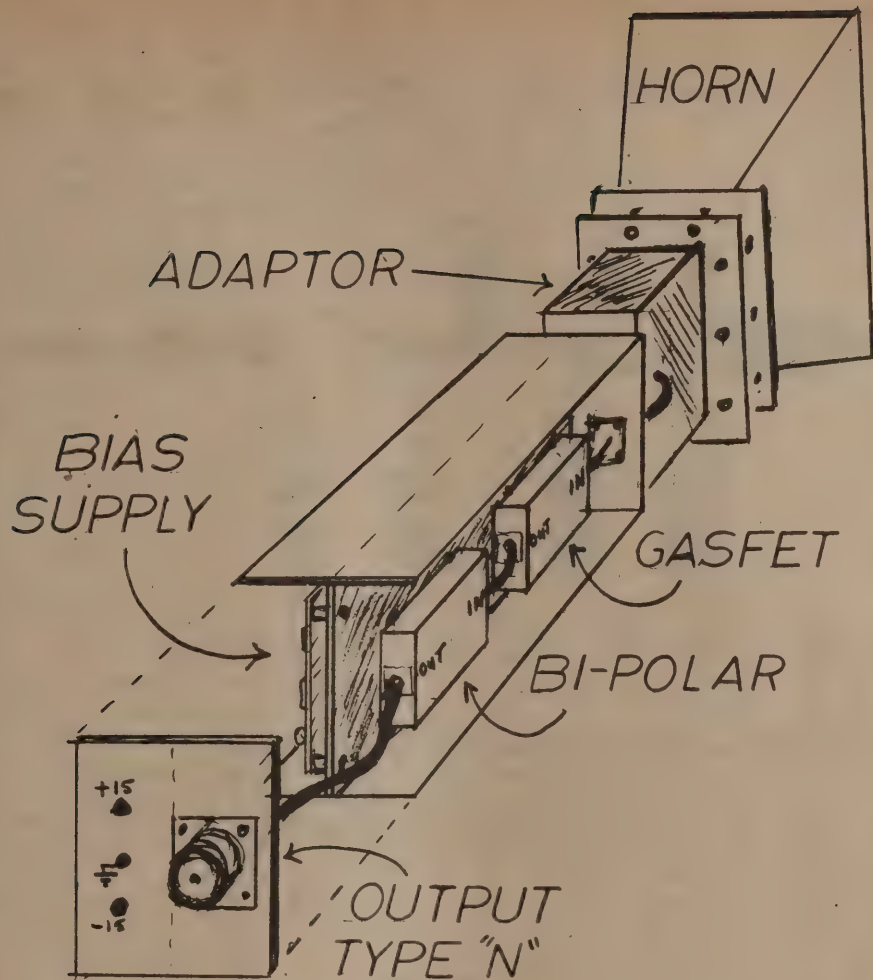


There are several Bi-polar amplifier projects available, one is listed in the Radio Electronics "How to build a satellite receiver," which is available for \$6 from Radio Electronics Magazine, Satellite TV Reprints, 45 East 17th St. New York N.Y. 10003

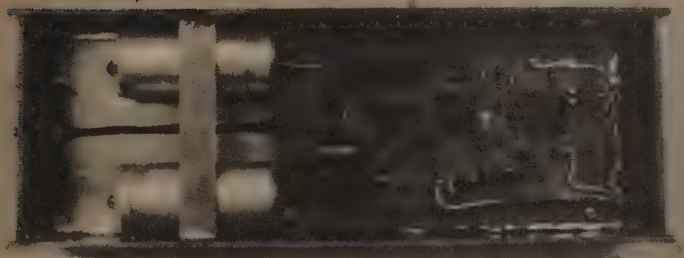
CONSTRUCTION of GasFet modules consists of .062 double sided epoxy glass PC material to be used for the box only, while .031 duroid must be used for the GasFet layout.



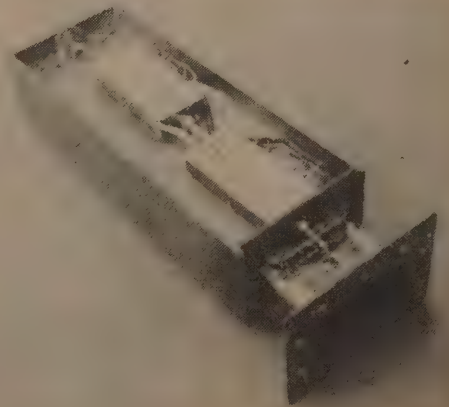
All PC Material can be cut with a table saw or large paper cutter. Inside dimintions are 2 11/16 inches by 1 1/16 inches. Cut ends wide enough to allow soldering on four corners. I substituted other feed-thru caps, and 12pf chip caps can be substituted for 10pf. While SMA connectors are recommended, BNC type will work. Source leads on GasFets must be bent and placed thru PC board and soldered on bottom side. DO THIS INSTALLATION LAST.

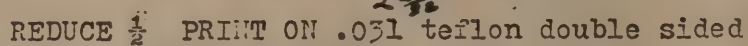


CONSTRUCTION OF AMPLIFIER consists of .062 double sided PC material; the center divider supports the bias supply and the individual amplifier modules. Waveguide adaptor is soldered on to the bos for additional support. All coax's can be RG 188 or RG 178 teflon type with SMA connectors. Side covers should be "tacked" on with solder, then sealed with RTV silicone. Use feed-thru caps for bringing the voltage to the outside. "N" connector is the standard that is used for outputting the RF. Individual amplifier modules are secured by tack soldering to center divider.



Bias Circuit Detail





Parts List: NE21889 FET (2 ea.) California Eastern Laboratories
10 pF Chip Capacitors (3 ea.) ATC #100A-100-J-P-X-50 or equivalent
1000 pF Chip Capacitors (4 ea.) Johanson #50R11W102KP or equivalent
1500 pF Feed-through Capacitors (4 ea.) Erie #2425-003-W5U0152AA or equivalent
Ferrite Beads (4 ea.) Fairrite #2643001301 or equivalent



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SSTV Over Oscar 8 Satellite

By Gale Sells W7AMQ

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I have been active on Oscar 7 and 8 for several years. My first contact over Oscar 7 was in December 1977; this was the same time I became interested in SSTV and purchased the Robot 400 unit. After getting acquainted with SSTV for a couple of years, I got the urge to try SSTV over a satellite though I had not heard any SSTV activity on the satellites up until then. On March 22, 1979 I sent out an SSTV CQ on Oscar 8 mode A orbit 5329. After trying several times over the following month I finally received an answer to my CQ from N7QM, Dwayne, of Prescott, Arizona. He did not have SSTV capability for over the satellite at that time but he told me about Bob W7KPW, who had done some SSTV over the satellite. With the help of Dwayne, Bob, and I made our first contact on May 3, 1979 over Oscar 8 mode A orbit 5914. We were successful in exchanging pictures and since then we have had several good contacts. The pictures enclosed are from our October 16, 1980 QSO over Oscar 8.

It's a real thrill to see your own SSTV returning from the satellit as it is being sent up. It is very difficult to receive a complete picture because of fading caused by the tumbling of the satellit in space. This causes a shift in antenna polarization horizontal to vertical. Fading is also caused by the radio wave traveling thru the ionized region of the ionosphere where the wave rotates in polarization. The receiver must also be constantly tuned to compensate for the doppler effect on frequency. The time available for SSTV communication over Oscar 8 is 15 minutes or less. During the pass the antennas must be made to track the satellite both for azimuth and tilt. The uplink and downlink antenna polarization is critical and must be set and occasionally corrected by sampling the return signal.

After considerable experience I have learned to choose polarization and antenna starting positions ahead of the pass time. The longitude and recent reception conditions helps me make these choices.

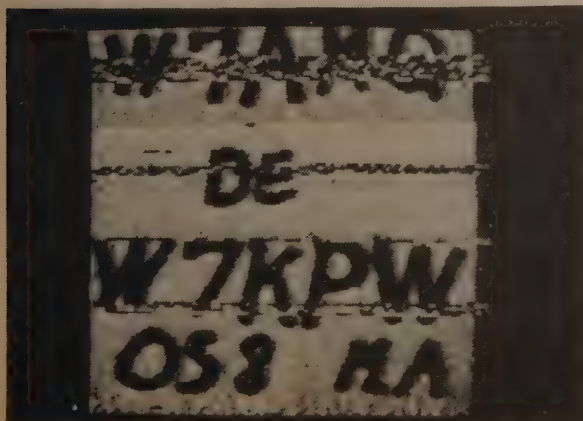
The various magazine publish Oscar operating schedules giving the date, orbit number, time for crossing the equator and longitude. We use either the Oscarlocator or Satellable calculators to determine the timing etc for all the passes after the initial one listed in the schedule. The calculator tells us when the satellite will be in range and illustrates the path also the varying angle of tilt necessary for the antennas.

We are really looking forward to the Phase III satellite which will be sent up in 1982. The access time in the northern hemisphere will be approximately 12 hours; because of this there will be only a gradual change in frequency as caused by the doppler effect.

Everyone interested should join AMSAT and also make donations to help them with their satellite programs.

I would appreciate hearins from anyone interested in or now sending SSTV via OSCAR Satellites.

W7AMQ



Single Frame Color SSTV

By Robert Suding WOLMD

Black and White SSTV is a rather straight forward operation. Just tune in the transmitting station so that his voice sounds natural, and then place your scan converter in receive mode when he begins to send SSTV. The picture paints down the screen as the picture is received.

Color SSTV is much more complicated. It is usually sent as 3 separate frames (sometimes 2) which must be properly placed in the appropriate memory. The transmitting station sometimes sends 1 frame of each color, sometimes 2 or 3 frames of each color, before proceeding to the next color. The sequence is normally a red frame(s), a green frame(s), and a blue frame(s). However, the system is not automatic. The transmitting station and the receiving station must manipulate several switches in the proper sequence to achieve a proper picture.

Several problems typically occur. Because of the significant amount of operator intervention, errors such as loading the wrong color to a given memory typically occur. Additionally, if a single line is lost due to a horizontal sync hit, all succeeding lines are misconverged. The resulting error is corrected by retransmitting the error frame, typically requiring a couple minutes of operator interchanges, assuming that the receiving operator correctly diagnoses which color frame is in error. The typical picture rate will be at best one picture every 5 minutes. In fact, rarely have I ever seen any color SSTV QSC send more than 2 or 3 pictures. Is that progress?

This paper is suggesting an alternative to frame sequential color SSTV. This new system is generically called Single Frame Color (SFC). SFC is certainly not a new topic. References to SFC may be found in A5 and other magazines for the past several years. But nobody has an operational system yet.

The bulk of the proposed systems have suggested using elaborate color burst procedures remotely related to the standard color TV system used by commercial TV stations. W9NTP described a system such as this in June, 1982 QST. W9NTP also attempted to show a similar system in operation at the 1982 Dayton Hamvention. Still, no successful system has emerged.

A wishlist for Single Frame Color SSTV might include the following ideas.

- * Resolution equal to, or better than, present color SSTV
- * Compatible with F & W SSTV.
- * Minimum transmission time, hopefully 8 seconds.
- * No continual operator intervention.
- * Able to be used on present HF equipment.
- * Present multiframe Color equipment can use system.
- * Be inherently simple, with a minimum of adjustments.
- * Permit future growth to greater resolution Color SSTV.

Obviously, all of the wishes will not come true with any one system. Even the relative prioritizations will cause considerable disagreement, and many hams would add and delete items to and from

the list. However, the above wishlist was generated based on my research into some of the ideals expressed by a number of those interested in SFC.

The colorburst derivative systems sound very intriguing. The chances of them being compatible with all of the present B & W SSTV systems is unlikely, and the chance of them being very simple is even less likely. Most of the colorburst systems also assume that the duration on the colorburst SFC system would be the same 8 seconds presently enjoyed by B & W SSTV. This obviously assumes that the same amount of color information presently being sent in 24 seconds will be sent in 8 seconds by using one of these wonderful colorburst systems. Having quit believing in the Tooth Fairy, and getting something for nothing a long time ago, I am very reluctant to accept an 8 second Color system as equal in resolution to a 24 second system.

The system proposed in this paper does not try to be particularly sophisticated. The intention is to develop and test a Single Frame Color SSTV system which will meet as many of the wishlist ideals as possible, yet be very simple. The W01MD SFC system simply uses a Vertical Sync pulse similar to the standard B & W SSTV and then a Horizontal Sync pulse directly followed by a Green, Red, and Blue line. Each of the Green, Red, and Blue line components may be a variable amount of time, but in the "full resolution" mode, each of the color components of the line will be 67 ms, including any attached sync pulse or header pulse directly attached. The Vertical Sync pulse is held for the duration of the SFC line, which would be 200 ms in the case of the "full resolution" mode.

A standard triggered sweep B & W SSTV monitor would detect the V sync pulse and then pick up the H sync pulse appended to the V sync pulse. The next 61 ms (I use 6 ms H sync pulses) would be displayed on the B & W monitor as a normal SSTV picture. However the next 134 ms will not be displayed, since no new H sync pulse is attached.

The SFC monitor will react similarly, except that the first 61 ms of video data will be loaded into the Green buffer. The next 67 ms will have the video portion loaded into the Red buffer, and the final 67 ms will have its video portion loaded into the Blue buffer.

The transmitting SFC system then transmits a H sync pulse and the 3 color portions for the next line. The process continues for the rest of the frame. Finally the frame ends with the Vertical sync pulse of the next frame. If each line is 67 ms x 3 colors long, x 127 lines of video, + one V sync line, then the SFC system will be 25 seconds/frame long.

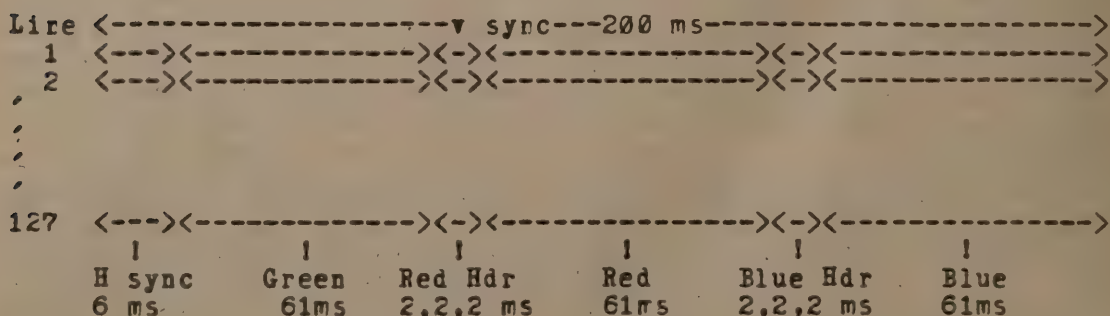
The major point of the system is that by merely sending line sequential color with the H sync pulse only preceeding the Green line, a simple Single Frame Color system may be achieved. The system permits reception by any triggered sweep SSTV monitor with no modification. Existing multiframe color systems must merely

modify the buffer switching to be automatic rather than manual, and load the Green, Red, and Blue buffers with the appropriate number of samples to the correct address over the 200 ms of the SFC line.

Obviously, the multiframe systems are not completely obsoleted, fulfilling one of the items in the wishlist. The WOLMD Scan Converter II required about a week of reprogramming to achieve not one SFC system but 8 systems. Several interesting possibilities for modification exist. In the interest of shorter frame times, the horizontal line time may be reduced. It is advisable to avoid shortening the Green line component too much, since the Green color carries the majority of the luminescence information (that's why I put it first in the sequence!). One rather interesting possibility is a 100 ms long H line time, resulting in a 12 second SFC system. The H Sync and Green video component are assigned 60 ms total (present 50 Hz. B & W SSTV standard) and the Red and Blue share the next 40 ms. The interesting item about this system is that if you divide 50 Hz by 5, or 60 Hz by 6, you will arrive at 100 ms, making 50 hz and 60 hz stations 100 compatible.

One other design feature of the WOLMD SFC is that a Red and Blue header are attached to the beginning of those parts of the horizontal line. The Red header consists of a 2 ms burst of 1500 Hz, 2ms of 2300 Hz, and 2 ms of 1500 hz. The Blue header is 2 ms of 2300 Hz, 2 ms of 1500 Hz, and 2 ms of 2300 Hz. These headers permit dynamically convergencing the 3 color components. Since they are not at the sync frequency, no retriggering occurs, and the receiver has the option of using them or not. The tone bursts will permit better convergence under some multipath conditions. They also permit proper convergence of the colors when the signal is played back from the usual cheap cassette tape recorder. By using a variable speed playback tape recorder the picture may be perfectly converged. The receiving operator merely adjusts the timing so that the two headers are displayed overlapping.

WOLMD Single Frame Color System



The system was initially tested on June 7, 1982. A test tape was made which had about 8 minutes of SFC pictures. This tape was played for the next few days over the air on 14230 Khz, tape

recorded and played back over the air by various hams, and again recorded at WOLMD near Washington, D.C. The results were very impressive. The conditions were far from ideal due to severe solar flare induced cyclic dropout and multipathing. Yet the pictures were readily recognizable, and achieved a much better informational delivery than the B & W picture of the same image. The impact of the Single Frame Color system convinced several SSTVrs who have witnessed the new system that perhaps now we really have color SSTV.

73,

Dr. Robert Suding WOLMD
1161 Reston Ave.
Herndon, Virginia 22070



(A5 Editor's note) "While work continues toward the "single-frame" COLOR SSTV mode frame rates, one thing must be kept in mind; COMPATIBILITY! Nothing will "kill" all the enthusiasm built up throughout the years of SSTV development as non-compatibility. Imagine the interested newcomer with a model 70 or even the operator who just spent over a \$1,000 on a new Robot 400 converter, monitor and camera and finds out during his first qso that he is already out of date to receive the color-sstv and non-8 second frame rate BW transmissions. In this day and age of rapidly advancing technology and a competitive number of operators searching for ways to advance the sstv state-of-art, remaining "compatible" sometimes means the choice of keeping things as they were or coming up with "new" standards. The company or individuals who can find common ground somewhere in between are going to be the successful inventors. With the coming of June and summer, came yet another "modification" for the presently popular ROBOT 400 converter by Howard Mc Afee KD6HF and Sam Mormino WA7WOD/5. This simple "mod" allows those owners of the 400 system with the 3000C "expanded interface" (3 memories) to send and receive a 25.5 second one-frame color pictures or BW. The circuit consists on 2 IC's, a few resistors and capacitors and a switch along with a required improperly named "256" modification (that never seemed to catch on a few years ago). Whatever eventually becomes the "way to go" for color sstv, be it the description by Bob Suding, the modification process by Interface Systems or SyceL Communications (VE3EGO), a devoted converter such as Volker Wraase's SC422, or via the personal computers such as the work being done by K6AEP or W6LLO-it is certainly we the users of the SSTV modes that will be the winners! The important thing is to be in there and become part of it! -QCD"

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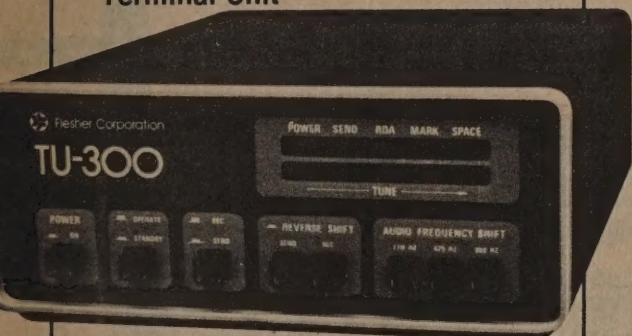
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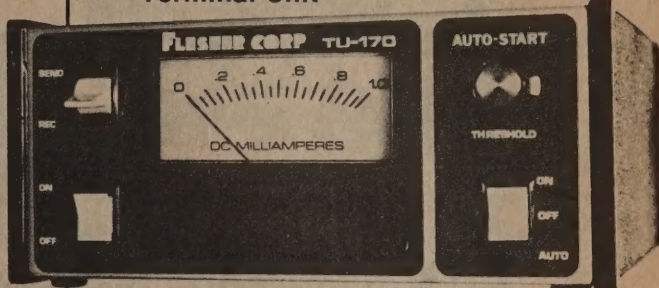
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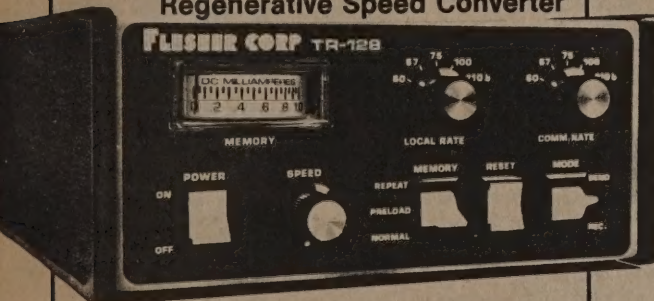
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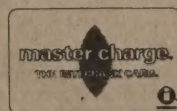
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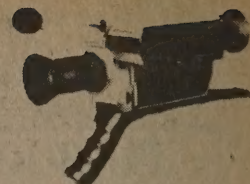
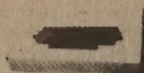
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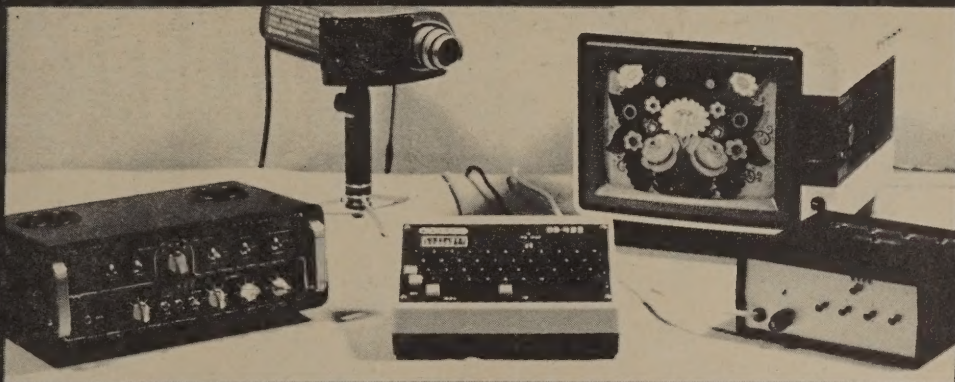
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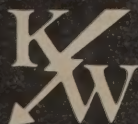
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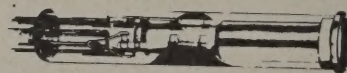
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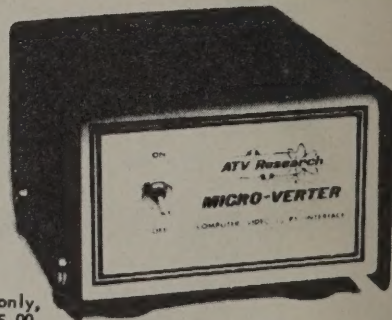
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